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THE RELATION OF THE MEDICAL PRACTITIONER AND THE PUBLIC TO THE CANCER PROBLEM

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THE public, as a rule, holds many erroneous ideas regarding cancer. This state of affairs is to be regretted, but it can very readily be explained. The public has not access to the columns of medical literature of the higher class, and it is to be feared it too often obtains its information from the lurid advertisements of the charlatan. Not a very reliable source is this, and a good substitute can and should be provided.

It is considered unprofessional and unethical for a physician to tell one of his friends that friend has cancer or to suggest methods of dealing with it, unless that friend consults him professionally, but one who is not a physician will not be open to this charge and the information may do some one a good turn or even save a life.

The public campaigns against typhoid and tuberculosis have accomplished such good results through the medical profession informing the laity freely as to the nature and curability of these diseases that it is to be hoped that the present campaign against cancer will be attended with similar happy results.

Unfortunately a very general impression prevails that cancer is incurable and many unscrupulous persons have availed themselves of this erroneous idea by depicting in vivid terms the sufferings of the victims of cancer and the uselessness of medicine and surgery in such cases, while setting forth the infallibility of some secret preparation known to themselves. Large fortunes have been amassed by these unscrupulous persons who unfortunately give only temporary relief to the sufferer.

The most effective way of combatting this lamentable state of affairs is to place before the public from time to time correct information on the whole subject of cancer by publishing articles written by medical men qualified to speak on the subject. Provincial and Local Boards of Health, Public Health officials and others similarly situated could aid greatly in this matter through the many admirable bulletins issued by them from time to time. The popular magazines could place this matter in a most alluring light for the benefit of their readers and to their own material advantage. The public press would most willingly co-operate if it were afforded an opportunity. A little combined effort intelligently directed would accomplish marvels. One cannot attempt to estimate the amount of entirely unnecessary suffering that would be avoided by a campaign on these lines. When the word cancer is mentioned it almost invariably suggests to the lay mind suffering pityless and relentless.

To the lay mind there can be but one end to cancer. As long as these ideas prevail so long will the result be what it too often is, and until the public grasps the real truth of the matter there will be no real progress towards a happier condition of affairs. The solution lies largely in the public's own hands.

Cancer is not always incurable. On the contrary, many cases have been cured and a much larger proportion could be cured if they were seen early enough. The earlier it is recognized and properly treated the better the chance will be for entire recovery. The trouble is that cancer starts in such an apparently insignificant manner that the public fail to see the necessity of consulting any medical or surgical practitioner on the subject until too late.

Cancer does not always start in the same way, but it frequently does start in a wart or mole, or a small lump or perhaps a mere scale, or roughness of the skin, or it may start from a blister on the lip where the mouth piece of a pipe presses, or the side of the tongue where the rough edge of a tooth rubs. It starts very often in some insignificant spot which has been irritated in some way, but it does not always start in the same way nor does it always start from irritation that is unmistakeable and easily recognizable. It may start at some point below the surface of the body or in some gland or some internal organ.

While it often grows rapidly it does not always do so. There may be no pain and very little discomfort connected with it. It comes in many diverse forms and acts in many diverse ways. It is inconspicuous, stealthy, insidious in its commencement. It is inexorable if neglected. It spreads through the channels of absorbent vessels, lymphatics, to surrounding and far distant glands, and to other parts in the interior of the body. Before this spreading process has commenced, many cases of cancer can be eradicated, but once it is under way it is almost impossible to eradicate it from its many ramifications or even arrest its progress, although we may prolong life in comparative comfort. The key to the situation lies in the early recognition of the disease; and nothing is too insignificant to be neglected in the way of symptoms or even suspicions. No time must be lost or wasted on household remedies suggested by kind friends, or the multitudinous pastes, plasters, lotions, no matter how many testimonials accompany them. In a matter of such vital importance it will be important to avoid quacks and charlatans. One will doubtless be informed of the miraculous cures they are credited with, but one cannot afford to take any chances with cancer.

Nor will surgical operations be required in all cases, although in some cases nothing but surgery will be of avail. Surgery holds a very important place in the war against cancer. But there are other measures available for many cases, and cancer and despair do not always walk hand in hand.

When the public learns to look after its general health as carefully as many of its number now look after their teeth it will mark a great step forward in the advance of civilization. Many people pay regular visits to the dentists as a precautionary measure, and they are right in doing so. But would it not be well if every man and child in the community were examined by his or her family physician at least once a year, or preferably more often, irrespective of how they felt. It would prove a prudent and profitable investment on their part. People too poor to pay the consultation fee could avail themselves of the many dispensaries and hospitals which are proving so great a boon to the needy. These examinations should not be casual or merely perfunctory in character. They should be thorough and complete, embracing the eyes, ears, nose, throat, intestines, kidneys, in fact all the organs of the body with careful enquiry into the functional condition of these organs, the state of the blood pressure and so forth. And no symptom apparently trivial should be neglected or withheld from the examiner. It is life insurance of a most practical type, which is going to benefit the insured and relatives now. There may be some obscure condition present which one may be unconscious of and on which the X-rays may throw some light and perhaps reveal some condition entirely unsuspected by the patient or physician, not alone of cancer but of other diseases. Even the condition of the skin may indicate a state of affairs tending toward the formation of cancer before the disease is really present. For instance cancer is apt to appear as a most in-

significant looking spot on the surface of the skin, lips, tongue or mouth, and not one of those inconspicuous trifles is too trivial for consideration.

Prompt action may avoid untold misery in the future and this prompt action must be entrusted to skilful trained hands at once. The laity dreads the word operation, but in very many cases no operation may be required, particularly in the early stages. There should be no "tinkering" nor experiments in the form of lotions, salves or ointments, no matter how widely heralded they may be. Nothing of this sort must be thought of for an instant, no matter how kind and sympathetic friends may earnestly and eloquently plead their efficacy, no matter how many testimonials may be presented. There is no time to be wasted on these delusions and snares. The best that science has to offer is needed and needed at once. And science has something to offer. It will not promise a cure every time, but it will very often secure one without promising, which after all is much better. Thousands of cases have been cured and remained cured by the skilful employment of such measures as the X-ray, fulguration, medical and other means, but all these require the most expert use. None but properly qualified practitioners, those thoroughly conversant with these measures and experienced in their proper employment should be entrusted with the care of the case; otherwise the result may prove most disastrous. One will do well to take the advice of his regular physician on the matter, and if the case is more advanced the patient will do well to be guided by him. Even here science may aid. Where an operation is imperative, one will often have a good fighting chance, for the most advanced surgeons to-day frequently have their patient exposed to the X-Ray for a short period before operation and for a longer period subsequent to operation, for they have found from experience that this procedure is of great benefit in the eradication of the disease and the patient's chances for recovery are immeasureably increased. The X-Rays used prior to the operation render the tissues around the cancer less liable to absorb and transmit the disease to other and distant parts; while the raying subsequent to the operation renders the tissues around the cancer less liable to absorb, it tends to destroy the cancerous material which may have escaped the reach of the knife and have been implanted in the vicinity and not recognizable by any means at our disposal. This raying does much to prevent the spread and the return of the disease.

And even where the disease is hopeless from the very start, science may afford welcome relief. Many a hopeless case has been relieved of pain, many a life has been prolonged, not in misery and enforced and irritating idleness but in comfort and ability to enjoy life in one's accustomed avocation and amusements.

Radium, too, of which we have heard so much in recent years both in its favor and against, may be called upon with benefit, chiefly in cavities of the body where the parts involved may be brought under its influence, which would not be so readily accessible to the X-ray. There are other measures of great aid in the battle against cancer, various forms of electricity which combat the disease or aid in the healing process.

From all this it may be seen that cancer is losing many of its horrors. It must not be inferred that any extravagant claim is being made that the disease is always curable in all stages, but the claim is made on the grounds of results actually accomplished, that many, very many cases have been cured when properly treated, and remained cured. There is no monopoly in the matter of cures, they are taking place all over the country. The great point is that the earlier one starts the better chance he has of conquering the disease. In this fight nothing is so trivial as a starting point against cancer that we can afford to neglect it.

The general public requires a most liberal education on all the foregoing data and members of the medical profession should aid in spreading correct ideas on the whole question of cancer among the laity. The public campaign against tuberculosis has accomplished marvels. Let us have a public campaign against cancer. Boards of health, public health officials, general practitioners, magazines, the press and the general public. All can help. Then commence now.

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THE PUBLIC HEALTH ASPECTS OF ALCOHOLISM

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(Conference of Medical Health Officers of Nova Scotia, 1915.)

THE subject "Public Health Aspects of Alcoholism" is one embracing a very wide scope. It contains within itself, the public health aspects of poverty, misery and crime, and indeed, one might, by an easy stretch of imagination, include within its comprehensiveness, the public health aspects of the so-called living wage, for we are compelled to admit that alcoholism is all too frequently the outcome of the existing wage, or of one which falls short of that wage. In brief, it is impossible to discuss this subject apart from concomitant associations.

As Public Health Officers I feel quite sure that we are all of one mind, that alcoholism has a pernicious, baneful and dire effect on the public health of our country. I do not think that there can be any controversial aspect in that regard; but I fear that as Medical Health Officers we have not as yet grasped the tremendous significance of alcoholism as a harmful factor in its relation to the great health problem of the preservation of humanity.

The trend of all medical practice to-day in the treatment of disease is prophylaxis; prevention by eradicating the cause, and consequently when we as medical men actually know that alcoholism is prejudicial to the public health of our country, we should be the first to inaugurate a campaign which could secure not only the cooperation of the individual in its prevention but which would point out clearly to the masses that it is impossible for most people to attain a high degree of efficiency, mentally or physically, if they indulge in alcohol. Show them that they can only assist in developing a healthy communal environment when they develop strong bodies, sending into the brain those apparent healthy, virile impulses which create a strong mind, clothing them with the high ideals of citizenship, which lead them not only to preserve their own bodies intact, but also impel them to render every assistance possible in the preservation of their brother-man. Imagine a county or province where the medical profession are engaged, unitedly engaged, in conserving the individual, engaged in a campaign of saving the individuality from himself, and you will have a public health sentiment of practicability.

In discussing the public health aspects of alcoholism I think we may treat of it from two standpoints, the direct aspects and the indirect. It is difficult to draw the line of demarcation. With reference to the former, however, we commence with the individual. He is the unit, in the public cosmos; the link in the great chain, and in speaking with the forger we ask is the link, is the unit, efficient? Does the individual who indulges excessively in alcohol affect the public health for good or evil? There can be only one response, viz.: for evil. He is the unit, but units taken collectively compose the public body, and if in the struggle against the sins which do so easily beset us, the individual physically or mentally succumbs, then also the public health must suffer.

Let us then for a short space of time review the effects on the individual. In the first place I would say it lessens the muscular power of the individual, in other words, it has a tendency to make indolent, and given a community of such individuals, it is quite easy to conceive of slovenly, unkempt citizens, whose associations with unsanitary backyards, ashpiles and overflowing cesspools creates no muscular impulse resulting in activity. Again it has a paralyzing, defusing effect on the central nervous system and I am sure you will all agree with me, that in order to thoroughly appreciate the aesthetic in life, one must be the possessor of a finely ad-

justed nervous mechanism, capable of creating a "soul" atune to an environment, which demands the beautiful in life as opposed to the sordid, the unsanitary and the ungraceful.

Again, as medical men, we know that alcoholism retards digestion and produces gastritis. Well, we all know persons suffering from such conditions are prone to take a narrow vision of life. Their vision usually measures up to their digestive capability. They have no outlook or interest in questions relative to public health. Again, alcohol is inimical to brain work. It causes cirrhosis of the liver, and hypertrophy of the kidneys. Those who are addicted to its use, if they require surgical interference —as they often do—have their chances of recovery minimized. We know that when individuals are employed in outdoor work, necessitating exposure to cold, that the greater the cold the more injurious is the use of alcohol, predisposing to pneumonia. The great Arctic explorer, Nansen, recognized this fact. On one occasion when he was a guest at a dinner of medical and other scientists held in Munich, one of the guests asked, "Did you take any alcohol when you left the Fram, to make your heroic expedition by sledges?" "No," said Nansen, "for if I had done so I should never have returned." Nansen had strong convictions, very unlike certain so-called statesmen in Washington, who agreed that alcohol must be sold in Alaska because it was cold and in the Philippines because it was warm. But this is somewhat of a digression. Again the alcoholic cannot assist in the great work of public health reform, and if he does become infected with any of the infectious diseases such as tuberculosis or venereal diseases, he is at once a dangerous person to society. The imbibing of a few drinks and his sputum can the more easily contaminate the dust of the ground and the virus of his debauchery may find easy access within the bosom of his innocent family and if so, can we compute the effect on the public health of even one such case? There will indeed be "woe and contentions, sorrow and wounds."

And here a great avenue of introspection bearing on public health reveals itself, viz.: the relationship of the alcoholic individual to family and community life. The introspection reveals a picture, all too true, but unpleasant of contemplation. We shall take concrete examples. Firstly: A young man commences life with good prospects, marries, his home is blest with children. He becomes addicted to the use of alcohol. The false security engendered, obliterates his sense of time. Ambition is relegated to the past, his business begins to decline, poverty with its twin misery, enters the home, and ere long we see the evil effects on public health. The wife, unaccustomed to such a novel state of affairs, is compelled to make both ends meet, and the struggle is a difficult one. There is retrenchment and economy in food, clothing and fuel. The struggle becomes fiercer and fiercer until finally alcoholism has triumphed. The time has come when the family know the house with the green plot no longer. They are compelled to seek shelter in a less favorable locality. Alcoholism has placed them beyond the usage of the sewer system. The father's ambition has given place to self-deterioration and degredation. The mother has developed slovenly and careless habits. She becomes the product of her environment. She and her children are ill-fed, ill-clad and ill-housed. Alcoholism has its reward in disease and death in that family. But the end is not yet; a child is born. A few years discloses that it is an epileptic; another child contracts scarlet fever or diphtheria, the infection spreads and alcoholism finds a victim in the family of a more fortunate individual. The public health is indeed suffering. Society has permitted, through its baneful legislation, alcohol to have a place. Society has injured and is being injured in return. Secondly: you see that farmer living on the outskirts of the town or city. You say, "That's a fine-looking farm. What does the owner do with such a large barn?" "Oh, he keeps many cows and supplies the town, or part of the city (as the case may be) with milk." You are passing on the same highway five or six years later. You ask with some surprise, "Is that the farm we passed a few years ago?" The response is "Yes, what's left of it. You know Mr. A. was flourishing; but he could not stand prosperity. He commenced drinking, became a confirmed drunkard, tried to save the impending financial crisis by watering the

milk, with the result that practically the whole town of X was infected with typhoid fever." The same may easily apply to the alcoholic butcher; the alcoholic engineer with his train of human freight; the alcoholic captain on the high seas.

And it is a sad fact, but all too true, that the public health has suffered in the past, if not in the present, from within the medical profession itself. Men within our own ranks, addicted to the use of alcohol, have doubtless caused injury to our public health. To those who in the past compelled, by the hardships and strenuousness of medical practice, to use this drug, the public will be charitable; but at this time, in the history of our country, when the watchword in our public health service is "efficiency," they cannot but look with marked disfavor upon the medical practitioner who indulges excessively in alcohol, and who places himself in the capacity of a private bartender by promiscuously writing prescriptions for liquor.

Alcoholism injures society in all its aspects, socially, commercially, spiritually, and last, but not least, physically. Slowly, but surely, alcohol produces poverty, and poverty misery, and although there are other contributing causes, yet I am sure that one of the greatest is alcoholism, and, gentlemen, where these factors exist, the public health must indirectly, inevitably suffer. Life under such conditions becomes merely an empty existence, devoid, very often, of any responsibility to either communal or moral law. The moral sensibilities become narcotized. Apathy, indifference and irresponsibility are products of "les miserables." Spitting on the streets and in public places creates no disgust or remorse of conscience in the mind of the unutterably miserable, nor do frequent visits to the garbage barrel awaken any fear in the mind of the child nurtured in poverty. The poor child thinks only of the delicious taste of the decayed fruit which he may find. Such people have no time to think of the transmission of disease. Compelled to choose between such a life and suicide, they prefer to survive, and if in their survival hundreds, yea thousands of others die, they cannot be considered culpable.

Alcohol is one of the most destructive agents to every organ and tissue of the body. As an agent for producing degeneration, it has been proved beyond a doubt that it is unrivalled and consequently it markedly lowers vitality, lessening the resistance to disease. Here we see largely the indirect effects of alcoholism. By reason of this fact, it predisposes to tuberculosis, and if it only predisposed to this one disease, that fact should forever banish it to the realm of oblivion, for I ask you is there one disease in this world that has caused more sorrow, more heartaches, more economic waste, more mournful effects on the public health of our country? Build your sanatoria. Educate your children, but remember this one fact that there will always remain a few tubercle bacilli to find a shining mark in the devitalized tissues of the alcoholic, and in the next twenty-five years your sanatoria will still be well filled.

This line of investigation with reference to lowered resistance, has probably done more than any other to refute the belief in the medical value of alcohol among physicians. Prof. Metchnikoff, who first announced the discovery of the germ-destroying property of the white blood corpuscles, investigateed the effect of alcohol upon them, and found that it checked their activity, thereby reducing their ability to destroy bacilli. Prof. Laitenen, of Helsingfors, showed that very small quantites of alcohol increased the susceptibility of rabbits to diphtheria infection; a parallel series of experiments by Dr. Geo. Rubins of Rush Medical College, revealed the same facts, and Dr. Reid Hunt, of the United States Hygiene Laboratory, also corroborated Dr. Rubin's findings. I have said alcohol causes degeneracy, some will say it is more often the effect of degeneracy, but the results of experiments oppose this idea. Prof. Frederick Martins, director of the Rostoch Medical Clinic, said at the Congress of Natural Medicine in 1905, in an address on Predisposition and Heredity, that alcohol causes a certain receptivity for other diseases and that it affects the generative as well as other organs. Prof. Demme, of Berne, found that in ten alcoholic families only 17 per cent. of the progeny were normal and in ten non-alcoholic families 88.5 per cent. were normal. Dr. McNichol, of New York, found that of the 3,711 school children whom he stud-

ied, over 70 per cent. of those whose parents or grandparents were alcoholics, were dullards. Of the children with abstaining parents only 4 per cent. were dullards. Prof. G. Von Bunge of Berne found from an extensive investigation that a very large proportion of women unable to nurse their children were the daugnters of drinking fathers, that in fact, the proportion of women unable to nurse, increased with the degree of the alcoholism of their fathers. This, if true, undoubtedly has a great bearing on our public health, as touching infant mortality, for we all realize the salutary effect of breast feeding, during the hot summer months.

The experiments of the leading scientists of the world goes to prove that alcohol is a prime cause of all grades of defectiveness, from simple dullness to the severe forms of mental and physical degeneracy. The effects of the degeneracy vary widely in their nature, as general dullness, rachitis, epilepsy, idiocy, weakmindedness, nervousness and monstrosities, resulting in the necessity for institutions for the feebleminded, poor houses and asylums, requiring a large outlay for upkeep, which money, if devoted to public health work, per se, would guarantee an efficiency almost beyond our contemplation. When we talk about medical inspection of schools, from many quarters the plea comes forth we cannot afford it. I tell you, Mr. Chairman, there is something in that plea, it is a fact, it is even difficult to get the taxes to keep even the schools, and sir, alcoholism is getting away with those taxes to an enormous extent. Close your saloons and you will not require so many jails, penitentiaries, asylums, nor such large hospitals, so commodious for the reception of the thousands of accidents, whose victims find their way there, every year, as the result of alcoholism. The public expenditure incurred through alcoholism is enormous, and if the Public Health Bureau could only place its hands on some of this cash, medical inspection of schools would not be so necessary as it is to-day. Overcrowded school-rooms with their unhealthy heating and often no ventilating system at all, and their seating arrangements conducive to kyphotic spines and contracted chests would be things of the past and the public health of our country would be enriched thereby.

Again, alcoholism leads to crime. Judge Renoult, of the Old Bailey Court, London, says that 90 per cent. of the criminals who come before him were there as the result of alcoholism and, gentlemen, back of crime are all the factors inimical to public health, individual deterioration, poverty and misery in the family, ill health, unsanitary conditions of the worst type and finally the murder of the individual. The public health indeed suffers and the cause in thousands of cases is alcoholism, which brings about premature, unnatural, and what Metchinkoff called violent death among the children of men.

I believe that poverty and misery, with their evil effect on the public health are moral questions, in a large sense, alcoholism playing a prominent part, and are only economic in so far as our social institutions and economic arrangements are at fault. You may say that defective personality is only a half way explanation of poverty and misery, but I say alcoholism produces defective personality, with resultant poverty and misery and evil effect on public health. Poverty and misery, just like tuberculosis, are communicable, and can be in a large measure cured and prevented. If the medical profession of Canada would play the part that it should play in stigmatizing the use of alcohol as a beverage, there would be less poverty, less misery, infinitely less disease and accidents, and a consequent high standard of public health. The years 1914-1915 were, and the years 1916 and possibly 1917 will be, the opportune years for the medical profession in Canada. Are we as the "great healing institution" of Canada going to grasp the opportunity and demonstrate to the people of this fair domain that we are sincere and honest? The medical conventions all over Canada have passed resolutions condemning the use of alcohol as a beverage, but, gentlemen, it has been said by that renowned psychologist, Prof. James, that "good resolutions pave the way to a less frigid zone than our own," and therefore all wishing as we do, to attain in the future a more mediocre clime, we would desire that the medical profession through its Dominion Council, strongly importune the Government of Canada to prohibit the manufacture and

sale of all intoxicants, at least during th war; and possibly Canada would find that what had been good for her during times of war was also equally good during times of peace. I believe that such a concerted petition might bear fruitage and if so we would go a long way in the advance towards a highly efficient public health service.

Gentlemen, I have attempted to show that our public health is suffering from alcoholism. The individual and the family suffer, the community and the nation suffer, and I trust that we, as public health officers in the Province of Nova Scotia, will not look complacently on the immoral tide which is bearing away so many of our brightest and best citizens to premature graves. I can assure you that you will need plenty of fortitude and courage. I know whereof I speak. I have had some experience along this line. We must respond to the call of the lofty principles of our noble profession and aim a death blow at this iniquitous evil, and today assembled as we are in the interest of public health, I think we should supplement the good work of the Nova Scotia Medical Society by passing a resolution somewhat similar to that proposed by Dr. Daniel McIntosh. The resolution which I submit is as follows:

WHEREAS it has been absolutely proven that alcohol has a pernicious and injurious effect on the public health of our country, in that it lowers the resistance of the individual to disease, thereby predisposing to tuberculosis and other infectious diseases, and,

Whereas it is one of the chief contributing factors to poverty, misery and crime,

Therefore we as Health Officers of the Province of Nova Scotia, place ourselves on record as opposed to its use as a beverage, and strongly recommend its use only upon medical prescription.

PREVENTIVE PHILANTHROPY IMPROVING THE CONDITION OF THE POOR AT LONG RANGE

By C. E. A. WINSLOW

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LEGISLATIVE hearings and letters to the newspapers remind us that there still survive some representatives of that earlier period when the easing of individual distress by gifts of food, clothing or money constituted the whole of the simple task of social relief. In the ears of such individuals the activities of the Department of Social Welfare and the Association for Improving the Condition of the Poor will sound somewhat strangely. In one laboratory a bacteriologist is studying under a microscope the changes in the lungs of a guinea pig which has been kept in a cage filled with a cloud of coal dust. In another an engineer is applying the most exact physical instruments to the measurement of the amount of heat given off from a moist parchment when a current of cool, dry air plays upon it. In another, the types of flies caught in a dirty backyard are being identified and labelled with their scientific names. In another, samples of food are being analyzed to determine their calorific value. The efficiency of filters for purifying water for floating baths is studied by the refined procedures of chemistry and bacteriology. The records of venereal clinics are searched, the history of patients discharged from contagious disease hospitals followed up trained investigators and the results tabulated and analyzed by elaborate statistical methods. The teeth and throats of school children are studied by dentists and physicians and the heating and ventilating plants of schools by sanitary engineers.

The old fashioned philanthropist may well rub his eyes and wonder whether in this year of poverty and suffering these things are not improving the condition of the poor in a somewhat roundabout way. The answer is that the A. I. C. P. by no means neglects the pressing calls for immediate alleviation. In its admirable appeals for help it specifies a long list of urgent needs from a warm blanket for a baby's crib, which can be provided for $1.00, to the pensioning of fifty widowed mothers and children for a year for $20,000. During the winter of 1914-15 the association spent $137,051 in family relief work, $61,934 more than in any previous season. The splendid and hopeful thing is that this organization, like so many others, is not content with the sisphyean task of pushing back the load of immediate needs, but is looking ahead and step by step is studying and remedying the underlying causes which if they are left unchecked will pile up the burden of suffering in the future more rapidly than it can be lifted by mere piecemeal measures of relief. "Besides working, it learns; it demonstrates; it advocates."

The Milbank Memorial Fund.

The Association for Improving the Condition of the Poor has been notably farsighted in its work since 1845; only two years after its organization it undertook an investigation of the housing conditions of the poor of New York city; and this step has been followed throughout the history of the association by many other pioneer attempts at a solution of the deeper underlying problems of social maladjustment.

With the gift of $650,000 to the association by Mrs. Elizabeth Milbank Anderson in 1913, it became possible to develop its long range preventive work in a more far-reaching manner and to organize for this purpose a Department of Social Welfare separate and independent from the Department of Family Welfare, which deals with the problems of immediate relief.

Mrs. Anderson's letter of March 5th, 1913, in which she outlines the purposes of her generous gift in full detail and with a notable grasp and foresight, puts the case admirably in the following sentences:

"In the first place I am particularly interested in fostering preventive and constructive social measures for the welfare of the poor of this city, as distinguished from relief measures affecting particular individuals and families. I fully appreciate the necessity for ministering to the physical needs of the sick, disabled and unfortunate, but in undertaking the work outlined in this letter, I wish to make it clear that the proposed Department of Social Welfare is to concern itself, in so far as it employs funds supplied by me, with a social program based upon preventive and constructive measures.

"Generally speaking, therefore, this program should include those activities which are calculated to prevent sickness and thus relieve poverty, such, for example, as the promotion of cleanliness and sanitation and the securing of a proper food supply. In this connection your association will doubtless find it advisable, in some cases, to cooperate with public authorities, and with existing agencies having similar objects in view where such agencies are practising approved methods in fulfilling their purposes, while in other cases it may probably be necessary to establish the work as a new enterprise, and in still other cases it will perhaps be prudent to devote some time and money to investigation and research before assurance can be given that any proposed measure will accomplish the object sought to be attained."

Mrs. Anderson's letter of gift provided for an attack of a most fundamental kind upon the causes of poverty. She directed the distribution of the enterprises to be conducted by the new Department of Social Welfare among at least three sub-departments or committees, one having jurisdiction over matters pertaining to public health and hygiene, one having jurisdiction over matters pertaining to the welfare of school children, and one having jurisdiction over matters pertaining to the food supply of the working classes. She provided in addition for a study by a special commission of the scientific problems underlying the practical art of ventilation.

The Air We Breathe.

The researches on ventilation I may perhaps speak of first because it is this part of the whole plan with which my own personal connection has been closest. The con-

THE FOOD EXHIBIT. Education regarding food protection and food selection, sanitary food principles and dietary food values.

THE ITINERANT PUSH CART—A practical demonstration of food protection.

dition of the atmospheric ocean in which we live is certainly one of the most important and most fundamental of all the physical factors which affect the health of man. Mrs. Anderson has therefore devoted the sum of $75,000 to scientific investigations for the clearing up of the broader questions of air conditioning. It is the first time in the history of sanitary science in any country that this subject has been approached from every viewpoint and with adequate funds for study. In the two years that have already passed, the commission known as the New York State Commission on Ventilation has shown that air of high temperatures has profound and harmful physiological effects upon the body and diminishes physical and mental efficiency; it has proved that the chemical constituents of the air of an unventilated, occupied room exert a subtle, bad influence never before measured by scientific methods; and it has accumulated for the first time exact data in regard to the effect of air conditions upon the membranes of the nose and throat in relation to the spread of colds and other forms of respiratory disease. Before the work of the commission is completed in 1917, it is hoped that we shall know in a general way what good atmospheric conditions are and how they can best be attained.

The Public's Food Supply

The question of food is even more vitally important than that of air. Yet here, too, there are many unsolved problems, and the knowledge that is available too often remains neatly codified in the laboratory while the public is left to derive what misinformation it may from the pseudo-scientists whose clever journalistic talent has gained for their half knowledge a wide and harmful influence in this field. In touching upon this matter in her letter of gift, Mrs. Anderson laid down a program which has been carried forward with notable success. The Department of Social Welfare has made a survey of the sanitary conditions under which food is sold in a typical East Side district containing a population of 100,000 people. The work was carried on in close co-operation with the Department of Health and has resulted in recommendations which have met with the earnest consideration, and for the most part, hearty approval of the Health Department. Partly, at least, from this study has come a reorganization of food inspection, the

adoption of inspection cards based largely on the ones submitted by the Bureau of Food Supply and the establishment, in cooperation with the Department of Health, of a clean and pure food exhibit to carry on direct educational work on food values and methods among distributors and consumers. This exhibit has been displayed at City College, at the Health Department Exhibit Hall, at a number of rent free stores in Manhattan and Brooklyn, and teaches not only methods for the sanitary protection of food, but points out as well the economic reasons for cleanliness. In addition the dietary factors in food education have been stressed, as part of the program of attack upon the so-called constitutional diseases, presumably so largely the result of errors in diet.

THE FOOD EXHIBIT—Clean and safe methods of displaying meats, bread, etc., protection from dust, flies and unnecessary handling.

On the economic side of this general problem, the most important work of the Department of Social Welfare has been an investigation of the cost of commercial handling and distribution of food in New York city, which yielded the significant result that 34 cents out of each dollar paid for groceries by the consumer is absorbed by the cost of distribution after the food leaves the city terminal. Partly as a result of these and allied studies there was established the Food Supply Store, first opened in 1913 for families cared for by the Bureau of Rehabilitation and Relief and now, with its branches, opened to the public. These stores should be particularly useful as centres for food education in their neighborhoods and among the families from whom they draw their patronage as well as for the distribution of fod at reduced prices. It is expected that this experiment may also throw some light upon the general economic problems of the cost and methods of food distribution in New York city.

Intelligent buying and use of food is quite as important a factor in the general problem as is a fair and economical system of distribution. A great deal of work has therefore ben done on special dietaries to be used in private institutions, lunch rooms, public kitchens, etc. In order that this knowledge may be available for the average consumer and housekeeper a study is being made at the present time in cooperation with the Department of Chemistry of Columbia University, the purpose of which is to ascertain whether a modernized dietary standard can be translated into a simple food budget, the use of which will not require scientific training nor technical knowledge of food values.

Feeding School Children.

Important work of the department along these lines has been done through its special School Lunch Committee, whose aims include:

Providing warm, stimulating food at cost to school children who for any reason cannot secure a well-balanced, nourishing noon meal at home.

Teaching children through the practical lessons of the lunch service the hygiene and efficiency of food selection, preparation and service.

Increasing the utility of the educational system by helping to put children in a fit physical condition.

During the term 1914-15, the committee provided lunches in twenty schools and served approximately 1,500,000 penny portions of food. In 1915-16 lunches will be served in about sixty-five schools, the service tending more and more to become self-supporting. At the same time the employes of the committee are annually examined for communicable pathological conditions in order to prevent the possible spread of disease. Further, the committee directed its attention to a concentration of work which would enable it to reduce to a minimum the cost of operation, in consequence of which in place of a kitchen with a separate staff of workers for each school, a central kitchen scheme was devised whereby the food for three or four schools was prepared in one centrally located plant with one kitchen staff and thence distributed to outside schools. It is encouraging to note that school principals and school lunch employes report that many mothers come to the kitchen to inquire how to prepare the foods which their children have eaten in school. Thus, not only does the school lunch service benefit the individual child directly, but through him exerts a beneficent influence in the home, awakening in the parent a new interest in the welfare of the child.

Public Health and Hygiene

Fresh air and food are perhaps the two most important elements in personal hygiene or the building up of a sound and strong body, able as far as possible to resist disease. Sanitation, as well as hygiene, is essential to personal and community health; to sanitation, or the prevention of the spread of communicable disease by systematic and enlightened cleanliness, the Department of Social Welfare has made important contributions.

Specific problems relating to the control of communicable disease have been attacked in a comprehensive study of an epidemic of typhoid fever in 1913 and in a more recent investigation of the operation of public and private venereal clinics. The typhoid study revealed the fact that 28 per cent. of the cases of typhoid were not reported to the Health Department and that the control of cases at home were in many instances defective. Most of the recommendations made to the Health Department were adopted with the result that the danger of similar outbreaks has been substantially decreased.

In the problems of insect-borne disease the department has actively co-operated with the city in discovering and eliminating Central Park mosquito breeding places. However, its most important study along this line has dealt with the relationship between flies and infant diarrhoea and here has been made a contribution of fundamental importance to sanitary science. Studies were made in which large groups of infants in selected tenement districts were carefully observed by visiting nurses throughout the warm months. In half the homes a special campaign against the fly was systematically carried out, the results of which emphasize most clearly the influence and relative importance of flies and home cleanliness in the production of summer complaint. For instance, as far as the fly itself is concerned, it was found that nearly twice as many attacks of diarrhoea occurred where flies were numerous as occurred where flies were a negligible factor. The dirty home was of almost equal importance when measured separately. When the influence of flies and dirt together was considered, there were nearly two and one-half times as many attacks of diarrhoea as occurred under what might be considered ideal conditions.

A social, sanitary, bacteriological and economic study of public and semi-public comfort station facilities has been made throughout the city. As a result of this work new comfort stations are being planned; soap, towel and sanitary napkin ven-

dors have been provided in many stations; a complete sanitary survey of subway, elevated and lodging house toilet facilities has been undertaken by the Department of Health, and a committee has been formed with the president of the Board of Aldermen as chairman, to take up with the operating companies the extension of toilet facilities in subway and elevated stations to the general public.

Whether or not cleanliness is next to godliness, it certainly stands very close to sanitation. The question of bathing facilities has for many years received a large share of the attention of the A. I. C. P. and it was the People's Bath, established by the association in 1891, which paved the way for the city to undertake the provision of public bathing facilities as a municipal function. With the organization of the Department of Social Welfare, inquiries were made showing that in sections of the city containing a population of 205,000 people, less than ten per cent. of the families had bath tubs and other bathing conveniences in their homes. Following its activity in giving publicity to the facilities offered by the association's Millbank Bath, the bureau undertook to awaken the city to an appreciation of the importance of advertising its public baths, space for 600 street car advertising cards having been secured free to the city and a very effective card to be placed in ten of the street car lines operating in the districts near the baths having been prepared. In addition, last year the department, inquiring into the sanitary condition of the water of the floating baths in the Hudson and East Rivers, felt obliged to take a strong stand against the practice of bathing in unpurified river water. As an experiment it assisted the Department of Public Works in maintaining a disinfection plant in one of the baths, remodelled so as to make it as nearly watertight as possible, and supplied with fresh city water. Action has since been taken by the Health Department to prevent bathing in unpurified river water altogether and to control the water of the floating baths in such a way as to make it sanitary.

THE PEOPLE'S KITCHEN—Hot, well cooked food at cost to the homes and factories in a congested neighborhood.

In the letter of gift of March 5th, 1913, Mrs. Anderson recommended that the bureau study the question of public laundries and consider the establishment of such a laundry. A house-to-house investigation of laundry, hot water and bath equipment indicated the need of such facilities, and consequently there was establish-

ed on the East Side the first mechanically equipped wet wash laundry in America conducted under quasi-public auspices. The laundry has now been in operation for several months, showing a constantly increasing patronage. It is at the present time operated to its full capacity and new equipment is being added. This agency for cleanliness and decency exists as a demonstration of sanitary methods of laundry operations and as a research laboratory for improvement in commercial laundry practice. It is planned as speedily as possible to place the institution on a self-supporting basis so that it may be perhaps an initial demonstration of the possibilities for the municipalization of clean clothes public necessities in New York city.

The Health of School Children.

Finally, in this long list of the activities of the Department of Social Welfare, brief mention must be made of the work among school children, which aims to conserve the child's physical resources. Briefly the program embraces co-operation with the proper public authorities to secure:

1. The extension of the system of medical inspection of school children to (a) detect, exclude from school, and isolate cases of contagious disease; (b) report non-contagious physical defects to parents for corrective treatment.

2. An effective follow-up system by nurses to insure prompt and permanent correction of remediable physical defects through parents if the family can afford private treatment and through public and private dispensaries and hospitals where family conditions justify free treatment.

3. Clinics for the free treatment of school children in need of it.

4. Scientific examination and sanitation of school buildings and their appurtenances.

In New York city the health of 884,547 children in 714 school buildings spread over an area of 326 square miles, is cared for by 331 doctors, nurses, surgeons and dentists of the Health Department. Studies by the Bureau of Welfare of School Children have emphasized the fact that this staff is wholly inadequate to care for the physical welfare of the school population. The staff examines approximately 37.3 per cent. of the school population each year. Of those examined, 69.7 per cent. are reported in need of medical or dental attention. Only 23.9 of the 69.7 per cent. are reported as treated for physical defects.

A number of surveys of the work of medical inspection have been made as a result of which the bureau has outlined and presented with the approval of the Department of Health, a definite program to place this work on a more adequate basis. The most prevalent defect found among school children is that of bad teeth. It is estimated that approximately 524,559 children or 59 per cent. of the school enrollment have defective teeth. An intensive study of the work of the six dental clinics resulted in a definite program of extension now in part adopted by the Department of Health. Further surveys have been made, in co-operation with the Bureau of Child Hygiene of the Department of Health, of the clinics treating nose and throat defects, the work of the Health Department refraction clinics, etc.

In co-operation with the Department of Education an intensive survey of the sanitary and equipment features of a large public school was recently completed, including the problems of ventilation, light, congestion, seating, toilets, water supply, etc. The purpose was to ascertain the facts and if necessary make friendly criticism and recommendations to the authorities regarding the school plant. Other buildings will be studied and from these surveys it is intended to formulate definite standards of urban school surveying, school sanitary score cards, etc. Undoubtedly the detailed recommendations to be based on the completed survey will result in more rapid detection and thorough correction of conditions inimical to the physical welfare of the child.

Investigation—Demonstration—Co-operation.

There are to-day in existence many splendid foundations for the study of sanitary and social problems. The combination of a solid scientific basis with an immediate practical application to the problems of to-day has seldom, however, been worked out so well as by the Department of Social Welfare of the A. I. C. P. Everything which it undertakes is based not on guess work but on a thorough study of ex-

isting conditions by means of the most refined methods of social, medical and laboratory science and with an absolutely open mind for the whole truth. Yet there is no gap between investigation and practical application. In the case of bathing and laundry facilities, of ventilation and of school lunches, the bureau has tested out its conclusions on a practical scale the moment that these conclusions warranted it in doing so; and its demonstrations have been carried out in such a form and in such a spirit as to invite and almost to compel the public authorities to follow its example without delay. "A complete welding of the power and prestige of the public agencies with the initiative and elasticity of private agencies means much in the increased efficiency of both. The Association for Improving the Condition of the Poor is endeavoring to make this welding process as genuine, active and effective as possible."

Private foundations dealing with municipal problems have at times shown a disposition to make a record of destructive criticism rather than quietly to accomplish results by co-operative effort. This spirit has been entirely absent from the work of the A. I. C. P. and as a result its relations with the City Government have been most cordial and most fruitful. The former Commissioner of Health of New York city stated publicly last fall that "the field of work of the Department of Social Welfare of the Association for Improving the Condition of the Poor is so comprehensive that it is impossible to say whether the Department of Health has adopted the Department of Social Welfare or the Department of Social Welfare annexed the Department of Health." Similar appreciative expressions of opinion have come from the Commissioner of Charities, the Commissioner of Parks, the President of the Board of Education, the Borough President, the Commissioner of Street Cleaning and other city officials, and between the Department of Social Welfare and these official agencies there have constantly been that genuine sympathy and hearty co-operation so essential to real and lasting success.

The work of the Department of Social Welfare is only in its initial stages for most of the beneficent activities provided by Mrs. Anderson's gift are to continue for eight years more. In the annual report of the department for 1915, the officers of the association set forth their aims and purposes in the following pregnant words:

"To act as a research or investigative agency in the field of social welfare, to supplement when necessary the work of the public agencies, to co-operate with the public authorities, to assist them in procuring better standards and in enlarging their fields of activity by demonstrating the imperative needs of the community and the most effective way of meeting those needs—such, in part, are the objects of, the justification for the existence of the Department of Social Welfare. Its methods are positive, co-operative and constructive; its doctrine that of prevention rather than palliation; its spirit grows out of a genuine belief in the ultimate efficacy of the growing social consciousness as an instrument for the correction, by educational and evolutionary methods, of the grave and acute social maladjustments of modern times."

This is a broad and noble aim, and an aim which the record of the past two years shows will be measurably realized. The Department of Social Welfare stands to the great city of New York on social lines in somewhat the relation of a research laboratory to a large industrial firm or of a state university to one of our progressive western states. It constantly looks to the future and untrammeled by the immediate tasks of administration it studies the fundamental needs of community health, formulates a constructive program of rational advance and presents its results so clearly and persuasively that the city can do no less than follow.

Not only New York city but the whole country owes a debt of gratitude to those who have planned and carried on this work. To Mr. Cornelius N. Bliss, Jr., and his fellow trustees of the Association for Improving the Condition of the Poor; to Mr. Bailey B. Burritt, general director of the association; to Dr. D. B. Armstrong, director of the Department of Social Welfare; and above all to Mrs. Elizabeth Millbank Anderson, whose generosity and broad vision made the work possible.

THE PLACE OF THE LABORATORY IN PUBLIC HEALTH WORK

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IN LOOKING over some letters which I found in my desk, written not more than two years ago to my lamented predecessor, Dr. M. A. Lindsay, I came across one from the head of the health department in one of the United States in which a statement to this effect occurred: "We do not make any examinations for physicians in this State, as we have no laboratory." This came to me as a distinct shock of surprise. The laboratory has been for so many years now in existence, and has in so many ways demonstrated its usefulness, that we have come to take it as a matter of course; and to learn that an important community had not thought it necessary up to this comparatively recent date, to establish one, had at least the merit of novelty, and was likely to afford food for thought. Most of us, I think, would take the position that the existence of a laboratory is a sort of "sign manual" of "up-to-dateness" of a people in matters medical. A medical school or hospital stands or falls on the completeness of its laboratories, and if these be so essential for the training of the student and the study of disease, it is difficult to see that they would not find a necessary place in that more specialized field of medical endeavor, the prevention and limitation of infectious disease. And yet, it is possible, as I shall proceed to show, that, given certain conditions, a laboratory may in some particulars be a hindrance rather than a help, if indeed its work be not actually misleading.

Before, however, passing on to the elucidation of this statement, it will be well to enquire into what constitutes the proper sphere of a public health laboratory. I find it necessary to refer to this matter at some length, for I have found a certain misapprehension on the subject in the minds of a few medical men in this province. When I came to Halifax first I learned that almost everything that by any streteh could be called a "specimen," from a dead dog to dusting powder, had been unloaded on the staff, with or without requests for examination. This, I learn too, has been the experience elsewhere. Now, what would any Government establish a Public Health Laboratory for? The obvious answer is "to cope with public health questions in cases where special knowledge and apparatus are required to arrive at a correct opinon." Put somewhat differently, a public health laboratory is a sort of court of enquiry to which medical men may refer matters of public health concerning which they may be in doubt. And, in a very intimate way, it may be regarded as the handmaid of the Medical Officer of Health. I need not inform this audience what the duties of this functionary are. But first and foremost among them are the detection and limitation of infectious diseases among the people of a community. And this applies practically, not to all, but only to such infectious troubles as are known at times to assume epidemic characters. Here it is that the Public Health Laboratory performs its proper function when it aids by its special methods the medical man engaged in these tasks. The examination of patent medicines, liquors, breakfast foods, garden seeds, and face powder, forms no part of its legitimate work. Nor does the examination of urine or morbid tissues, stomach contents or faces, at least in this country, have any bearing on the public health. I have met one or two medical men, I am glad to say not more, who thought the Provincial Laboratory should undertake gratis every kind of chemical, bacteriological, and pathological work that might be submitted to it as a part of its routine duties. When one looks at the ques-

*Read at the Convention of Medical Health Officers of Nova Scotia, held at Truro, Sept., 1915.

tion fairly there is no particular reason why a Government should supply the medical profession for nothing with the services of an expert bacteriologist and pathologist any more than it should be called upon to provide an operating surgeon or a consulting physician in all cases where such might be useful. No one thinks of asking the latter. The crux of the whole matter is this: public money should be expended for the public weal, not for the benefit of any individual or special group of individuals. To ask a public health laboratory to examine and report upon, say, morbid tissues, free of charge, is to ask a Government to allow its material to be used and the personnel of its staff to be utilized for the benefit of the individual, for the good of the one and not of the many. It is doubtless of great importance to a community to have among them persons trained to such work, whose opinions are authoritative, but it is not public health work. It is, of course, open for anyone to claim that a Government should make provision for the free examination of any and all kinds of material that might be submitted to a medical laboratory, but very few do, and our own Government certainly had no such idea in mind when I was invited to take charge of the work here. But apart from the unethical character of such notions, there are other objections of weight other than such as I have cited. To do all kinds of medical laboratory work gratis would mean that the staff would be inundated with all kinds of material which would claim attention equally with, what is infinitely of more importance, the strictly public health work. A small staff such as ours would be unable to cope with it properly, and the efficiency of the laboratory would be proportionately diminished. I take it then that, bearing in mind the principle that I have laid down, that the public health laboratory is for the elucidation of public health problems, the legitimate functions of a laboratory, such as ours, would be to examine and report upon material derived from our own people, which may be submitted by medical men, and particularly medical officers of health, in connection with diseases such as tuberculosis of the lungs, diphtheria, typhoid fever, epidemic cerebro spinal meningitis; specimens derived from domestic animals when submitted by veterinarians, such as rabies, glanders, and actinomycosis, provided that they are of such a nature as to menace the health of human beings. The examination of films for gonococci or treponema pallidum, and the Wassermann test, do not, in my opinion, properly belong to public health work. In this country, at least, gonorrhea and syphilis are not notifiable diseases; they do not tend to become epidemic; and the state takes no measures to prevent their spread.

An important matter is the examination of water. Cases arise now and then where suspicions arise as to the purity of a water, and it is a question in how far a public health laboratory should concern itself with this matter. In the case of our provincial institution it was not contemplated that water examinations should be conducted without charge. This work is very special, requiring the services of one expert in this direction. It is time consuming, and it is my opinion that the results achieved are by no means in proportion to the labor involved. Still, speaking for myself, having in mind the principles I have already enunciated, I would be willing to carry out a limited number of water examinations on a free basis, under conditions. For example, I would examine one sample of water gratis in the case of municipal supplies and public institutions, provided that such were sent by a regular Medical Health Officer, who would certify that there was good reason to suspect the water as being the cause of epidemic disease. Water, however, derived from industrial plants, private corporations, hotels, and individuals, repeated samples or samples submitted by any persons for causes other than the regular and periodical examination of water su[illegible] would only be examined for a fee. [illegible] *qua non* would be that the waters submitted for examination are to be collected, packed, and shipped according to specific dir[illegible] which would be furnished. The reas[illegible] these stipulations will appear anon.

Having considered what I cons[illegible] the legitimate functions of th[illegible] Health Laboratory, I pass on to its limitations.

With the advent of the bacteri[illegible] and pathological laboratories in medica[illegible] schools, there has been a tendency exhibited to attach to them a somewhat exaggerated

importance. "Send it over to the laboratory," was the order of the attending physician, and too often the laboratory was the excuse for a perfunctory physical examination. The laboratory had the "last word" in the opinion of many men. Then it was found that the laboratory findings appeared to be at variance with clinical experience, and, until explanations of the discrepancies were forthcoming, a reaction set in, so that the findings of the laboratory worker were at a discount. The truth of the matter is that the laboratory should not be relied on to make diagnoses. It is merely the helper, doubtless the chief one, yet always the handmaid of the clinician. The educated hands, eyes, and ears, are still, as they have always been, the essential tools in making a physical diagnosis. When the expert in laboratory methods makes a report, he should be understood as simply stating what he finds or does not find, without expressing any opinion as to the nature of the case. It is the duty of the attending physician in the last instance, to make the diagnosis, utilizing, of course, all the sources of information open to him. When I report finding the tubercle bacillus in a sputum that is, of course, tantamount to making a diagnosis, provided I use the most approved methods of examination, but a negative result is not entitled to the same weight. Of all things in connection with laboratory investigations the negative finding is the most deceitful. If I do not find the tubercle germ in a sputum, it would be manifestly wrong for the attending physician to assure his patient that he does not have tuberculosis. A negative finding in the case of a cerebrospinal fluid might, however, be of importance, as pointing to a tuberculous origin. Even with the greatest care a certain element of chance enters into our work. Not long ago I examined no less than four different samples of sputum from the same patient with negative result. My assistant passed at the fifth and reported it negative. On looking it over myself, after prolonged search, I found one bacillus of tuberculosis, and only one. I just happened upon it. That one little point was sufficient to completely alter our report. Again, take diphtheria. It is not generally realized that there are a great many forms of the diphtheria bacillus. Wesbrook and his pupils have isolated nineteen different types. Some of these are found in the throats of those suffering from diphtheria; others, in the throats of those who clinically do not have diphtheria. The pathogenicity is clearly not the same for all forms. It is known that the diphtheria bacillus can sometimes be isolated from the throats of persons brought into close contact with diphtheria cases but who do not present any manifestations of the disease themselves. To find, then, the diphtheria bacillus in a swab from a throat is not the same thing as making a diagnosis of diphtheria in that particular case. Yet such people call for special measures, inasmuch as there is reason to believe that they may be sources of infection for others.

Take the case of typhoid fever. A positive Widal test does not inevitably mean that the individual from whom the blood was taken is presently suffering from the disease. He may have had a preventative inoculation of typhoid vaccine; he may have had the disease before; or, if the dried blood method be adopted, too low a dilution of the serum may have been employed. A negative finding notoriously does not exclude typhoid fever. The reaction is most erratic, appearing and disappearing apparently without reason. I have known the test to be five times negative before it became positive. One source of difficulty in the matter of obtaining positive results in laboratory investigations lies in the fact that disease is not always uniform in its course and manifestations. A negative finding usually calls for repeated examination. Thus, in the case of tuberculosis of the kidney, it is extremely difficult to find the specific bacillus in the urine, even by the most approved methods. This may depend on the fact that the excretion of the bacillus is irregular. The specimen we examine may have no germs in it, while one taken at another time may contain them. It is always better in suspected cases to collect the whole urine for twenty-four hours, allow it to deposit, and collect the sediment for examination. Or, it may happen, that the tubercle bacillus may disappear altogether and be overridden by other forms.

It is not uncommon for the Public Health Laboratory to be asked for chemical and bacteriological reports on water and milk. The specimen is often sent without the absolutely necessary precautions being taken

that it is free from extraneous contamination, or that changes during transit have been avoided as far as possible. There is quite a child-like faith in many quarters in the ability of the Laboratory to afford valuable information under such conditions. I wish to record my opinion that ordinary laboratory examination of water and milk conducted under these circumstances is of little value. Even, where all the necessary precautions have been taken to the letter, the chemical and bacteriological examination of water, while of some importance, may be entirely misleading unless considered in connection with the local conditions of soil and supply. The laboratory worker must be in possession of all the facts, if his opinion is to have any value. A personal visit of an expert to the locality is essential as well, if the truth is to be elicited. One is sometimes asked to look for B. Typhi in a sample of water. This should always be done in a bacteriological analysis, but it is well to remember that this germ is not found once in a thousand times. The presence of B. Coli in numbers is a better criterion of dangerous pollution of a water. And so I emphasize the point that the laboratory worker in the main should state facts rather than opinions. In considering the limitations of the laboratory it should not be forgotten either that any delicate biochemical method will occasionally "go wrong" no matter how carefully conducted, and there is always the personal equation to be reckoned with. Even a public health officer is not infallible.

We will now pass on to consider how the work of the Public Health Laboratory may be made to reach the highest efficiency. Here the factors of importance are the personnel of the staff and the attitude of the outside medical practitioner. Of the former I need say little. It is obvious that the staff should be competent and painstaking, and it should certainly be large enough to cope with its varied duties. In larger centres than Halifax and with a larger monetary appropriation it is possible to put a specialist in charge of the different departments, such as the bacteriological, chemical, epidemiological, and immunological. Some institutions go the length of treating certain diseases as well, such as rabies, but with us we have to be more modest and do the best we can with somewhat limited provision. The successful head of a Public Health Laboratory, in my judgment, will be a man of broad range, preferably a medical man, and preferably, too, one who has had some clinical experience in addition to his special laboratory training. One thing is certain, the best results will never be obtained from any laboratory without the sympathetic and friendly co-operation of the Medical Health Officer and general practitioner. Thus, a little trouble taken to furnish the laboratory worker with details in any given case, such as the patient's name, age, the date, the character of the disease, the more important clinical features, probable diagnoses, etc., will do much to enable him to intelligently carry out his side of the investigation. If a second, third, or fourth specimen be submitted the fact should be stated. Above all, material for examination should be sent him in such a condition that it can be utilized. A few hints here may not be out of place.

Sputum should be sent securely corked and packed in wide-mouthed bottles. Those of the ordinary vaseline type are excellent. A small quantity of 5 per cent. carbolic acid solution should be added to preserve it. The patient should be instructed to rinse out the mouth with clean water before expectorating. Saliva should not be sent, but only material that definitely has come from the lungs or bronchi. The first material brought up in the morning is the most likely to contain tubercle bacilli. If this is insufficient in amount a twenty-four-hour sample should be sent. Packing is important. I have received sputum in an ordinary paper sputum cup pressed flat. This is dirty and dangerous as well. Sometimes the cork has come out of the bottle and the contents get over one's fingers.

Sterilized swabs will be supplied from our laboratory to all medical men applying for them, and it is hoped that Medical Officers of Health particularly will keep a supply. In suspected cases of diphtheria the swab should be applied to the diseased part accurately, without contamination from other regions of the fauces and sent promptly for examination. It is essential that such swabbings should not be made after the use of an astringent gargle or antiseptic wash. In cases where the regulation outfit is not at hand, one may be

improvised very simply. Take a small bottle, fit a cork to it, and fit a suitable bit of wire to the cork, and sterilize the whole by boiling. Wrap a bit of sterilized gauze about the end of the wire, and there you are. This is preferable to sending the secretion on a bit of cotton wool loose in an envelope, as I have seen done. No one has a right to jeopardize the life of another in this way.

Specimens of blood for the Widal test are usually sent in on a bit of paper or glass. It is not generally known that blood should not be placed on glazed writing papers. Sufficient size may be mixed with the blood when it is diluted in making the test to produce a fallacious agglutination. If paper be used at all, the best is French white filter paper. It is better to place the drop of blood on a bit of glass. Care in packing is here necessary. Those who have the ordinary Thomas-Zeiss blood counting apparatus may measure out a definite quantity of blood and notify the laboratory of the amount. Then the dried blood can be standardized. The best method of all is to send about a half to one cubic centimetre of blood in a pipette sealed at the ends. A pipette of the type of Wright's for opsonic work is excellent. The advantage is that accurate dilutions of the serum can be made and the results consequently are of more scientific value than those arrived at by the more convenient, but "rule-of-thumb" dried blood method. It is my intention to prepare in the future a supply of such pipettes which may be had on application. In sending blood for Widal work it should be stated whether the patient has ever had typhoid before or has been subjected to anti-typhoid inoculation within three years.

Samples of water or milk intended for bacteriological examination should be collected in sterile bottles, with rubber corks, and sent with the shortest delay, packed in ice.

Samples of urine need to be very carefully packed and if sent any distance should have a bit of thymol placed in the bottle. Some specimens reach me often positively putrid. Occasionally the bottle is in fragments.

I am getting out some printed instructions as to the best methods of collecting and sending material to the laboratory, attention to which on the part of practitioners will do much to enhance that efficiency on which I place such a high valuation.

Given a suitable specimen, sufficient in amount, well-preserved, and properly packed, the laboratory worker will not be unnecessarily hampered in his efforts, and his attempts will be correspondingly more accurate and useful. For my part, it is my constant endeavor to make my reports helpful to those calling upon me. Thoroughness and care in the work, and promptness in sending back reports do much to establish a reputation for reliability.

THE ATTITUDE OF THE FEDERAL GOVERNMENT TOWARDS TUBERCULOSIS

By GEORGE D. PORTER, M.B.

Secretary of the Canadian Association for the Prevention of Tuberculosis. Chairman of the Section of State Medicine, Academy of Medicine, Toronto.

WHILE recognizing the importance of preventive measures against disease in times of peace, their results show up more vividly, and their benefits become more strikingly apparent in times of war. Even now, with a larger army in the field than ever before, the percentage of disease, according to Sir James Crighton Browne, "is lower than in times of peace, and the unprecedented healthfulness of the British army is a splendid tribute to sanitation."

Interest in the more chronic diseases, such as tuberculosis, will naturally give place for a time to a greater attention to those more acute infections, such as typhoid, typhus, dysentery, tetanus, and septicaemia, which are always threatening our armies in the field and in the trenches. It must be borne in mind, however, that the soldier's very strenuous life, with its hard campaigns and prolonged exposures, to say nothing of the injurious effect of inhaling noxious German gases, will inevitably leave many of them in just that physical condition so favorable to the inroads of tuberculosis. Colonel Primrose has already reported from the front that in a large percentage of the cases examined, which proved to be tuberculous, it was obvious that an active condition had been engrafted upon a healed lesion. "It is not surprising," he says, "that there is a danger of pulmonary tuberculosis developing in those who are predisposed thereto."

The measures of relief instituted in the past will, therefore, be most useful for the future when we may look for a larger number of tuberculous amongst us than we had before. This has already been demonstrated by reports from Switzerland where it is said "twenty-five hundred tuberculous prisoners will shortly arrive there from belligerent countries for special treatment," while in Canada a number of tuberculous soldiers have already been received in some of our institutions.

According to Osler, the tuberculosis problem is a medico-sociological one. "On paper the problem looks simple—to put all in healthy environments, with good housing and proper food, which are essential preliminaries to healthy habits; to recognize the disease early and to put patients in the best possible circumstances to promote cure, and to guard the community against dangers associated with advanced incurable cases. The first is a basic, economic question—re-housing will take at least a couple of generations. An abundant supply of good food means better wages, and a stricter protection against external contamination. The second is met by efficient home treatment and by hospitals, dispensaries and sanatoria. The third by a closer supervision of dangerous cases, and better provision for their segregation."

Owing to the great area of our Dominion, the scattered population, and the extreme changes in its climate, the tuberculosis problem in Canada is a very difficult one to deal with. Until 1898, when the National Sanatorium Association founded its first sanatorium at Gravenhurst, we had no special provision for the tuberculous anywhere. In 1900 the Canadian Association for the Prevention of Tuberculosis was organized at Ottawa for the purpose of preventing the spread of tuberculosis by an educational campaign consisting of the circulation of literature, lectures, the formation of societies for the purpose of enlisting the co-operation of the people generally with the medical profession, the Governments, and other organizations to provide suitable accommodation for the tuberculous in hospitals and sanatoria, to establish dispensaries to supply visiting nurses and to advocate the enactment of suitable laws for the prevention of the disease.

This association was subsidized by the Federal Government and now receives an annual grant of ten thousand dollars.

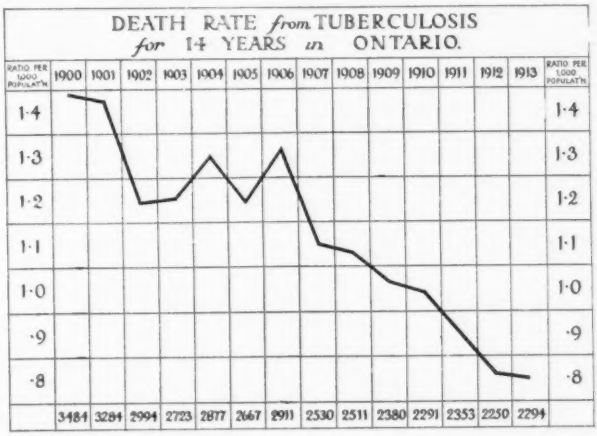
When organized there was practically no legislation regarding notification, disinfection, and matters dealing with the housing problem. With one exception there was no special provision for the tuberculous in Canada. Now we have some thirty-five institutions scattered over the country, about fifteen special dispensaries, numerous visiting nurses in various centres, and over one hundred local societies.

The accommodation in the various institutions now totals over 1,800 beds, or one bed for every 4,407 of population. All of these, with the exception of the one in Nova Scotia, have been the result of private initiative and private philanthropy, assisted later on by the provincial and municipal Governments, thus proving the value of voluntary agencies just as we see the value of voluntary agencies in war relief work to-day.

In Scotland the ratio is one bed for every 1,750 population, while in the United States it is one bed for about 2,900.

In Ontario the ratio is one bed in 2.403 of population. As will be seen in the provincial health reports for Ontario there has been a marked decrease in deaths from tuberculosis in the last decade, and, while there is not sufficient evidence to prove that this decrease is due to the increase in accommodation, yet it is significant that in those provinces where little or no accommodation is provided for the tuberculous there is no decrease in their tuberculosis death rate. Manitoba, which comes second in the matter of provision, also comes second in its decrease in such death rate.

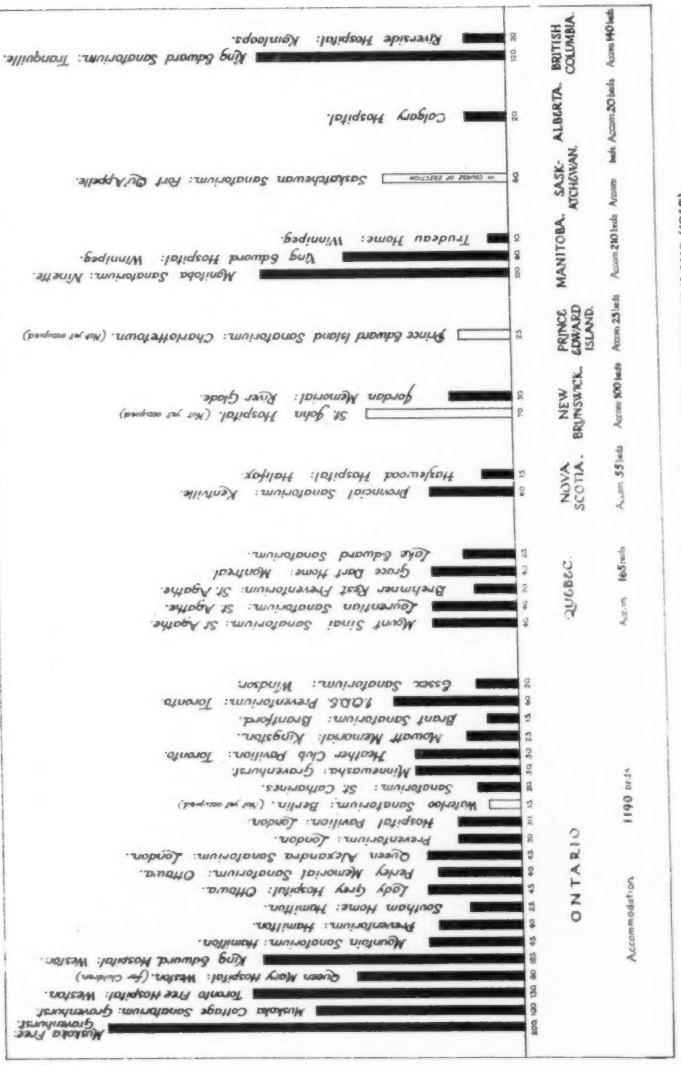
While it may be too much to say, as Newsholme has deducted from English figures, that such a cause is sufficient, yet we may assume that these results are due in a large measure to the proper care of the tuberculous, segregation of the advanced cases, better hygiene and social conditions generally. Where the people are wise enough to make provision for such cases they are generally more apt to attend to other sanitary matters as well. On the other hand, where apathy prevails regarding this disease, apathy is likely to prevail towards sanitation generally.



Besides this, the sanatorium idea has influenced the treatment of the tuberculous in their own homes, as well as improved our mode of living as shown in the better ventilation of public buildings and private houses generally. This can be seen by the more prevalent custom of sleeping with the bedroom windows open and in the increased number of open air sleeping balconies everywhere.

The Federal Government takes the ground that under the British North America Act the care of the sick is a provincial and municipal matter, and it therefore does not assume responsibility for the provision of the tuberculous.

Under the Department of Agriculture reports upon tuberculosis and literature



CANADIAN SANATORIA AND HOSPITALS FOR THE TUBERCULOUS (1915)
ACCOMMODATING 1805 PATIENTS.

bearing upon its prevention have been issued from time to time, together with literature upon the question of bovine tuberculosis, while the Conservation Commission has issued reports upon the same subject.

The Federal Government has also taken steps to prevent the spread of bovine tuberculosis through milk from infected cows. An order-in-Council has been passed providing for the co-operation of the Federal authorities and the cities and towns all over Canada for the eradication of bovine tuberculosis from herds supplying milk to such municipalities. It is specified that the city or town must first provide for licensing all milk vendors, for clean and sanitary dairies, for the prohibition of the milk sales within two years of the test of the cattle of any dairy unless a clean bill of health is shown, and for the appointment of a municipal instructor. On fulfilment of these conditions, and on application being made by the municipal authority to the Veterinary Director-General, Federal inspectors will be sent to make tuberculin tests. Any diseased cattle may be slaughtered, and compensation to the owners is to to be allowed at the rate of one-half the appraised value of the cow in a case of open tuberculosis, and one-third value if destroyed as a re-actor at the request of the owner. No compensation is to be paid to the owner unless, in the opinion of the Minister of Agriculture, he assists, as far as possible, in carrying out the instructions of the inspector as to disinfection and other necessary precautions.

This, then, with the exception of any assistance to the Indians under the Department of the Interior, is the extent of the Federal Government's aid to the tuberculosis problem.

While admitting the great importance of education in this work, and without creating an intelligent interest in the public mind and securing their co-operation, no permanent improvement can take place; yet it has been felt by the great majority of workers in this field that some financial assistance should be given towards the care of the tuberculous by the Federal Government.

Needless to say, many suggestions have been offered and schemes brought forward from time to time, but whether in the form of provincial subsidies based upon the amount of work done for the tuberculous, or upon the population of the various provinces, objection could be taken on the ground that the largest and richest province (Ontario) would receive the largest grant. Some of the smaller ones, such as the Maritime Provinces, on the other hand, where less work has been done, but where tuberculosis is somewhat more prevalent, would receive the least. Then again, the Western Provinces claim they have become more or less resorts for the tuberculous on account of more favorable climatic conditions, thus placing comparatively heavier burdens upon them.

Apart from some form of insurance, the Federal Government might avoid these difficulties and still assist in this work by subsidizing the various provinces according to the number of the tuberculous in each province, as shown in the notification returns for this disease. Some such policy would not only assist in bringing to light many more cases, but it would afford the various local authorities an opportunity of dealing efficiently with them. Among other things, local institutions, or special wards in general hospitals for the advanced cases and more widely scattered and larger sanatoriums for the incipient cases, assisted by the municipality, the county, the province and private philanthropy, as is done in Ontario to-day, would be greatly assisted by Federal support. This, together with legislation favoring better conditions of labor, proper housing, and all those measures found useful in raising the health of the people, would certainly lessen the great mortality and the enormous financial loss from this most widespread and impoverishing disease. As the attainment of this object is dependent upon administrative measures and Government support, as well as upon scientific and philanthropic efforts, may we not hope that in the near future our Federal Government will follow the lead of other countries and assume its proper share in protecting the health of the people and assisting, not only by educational methods alone, but by liberal financial support, all approved efforts now being made against tuberculosis in our Dominion.

TROPICAL SANITATION IN ITS RELATION TO GENERAL SANITATION

By W. C. GORGAS, M.D.

Surgeon-General, U.S. Army

FOR the last three or four hundred years it has been known by Europeans that military expeditions involving large bodies of white troops could not be undertaken in the tropics on account of the great loss from disease. In the many cases in which such campaigns had been undertaken, they had failed on account of the loss of life caused by, and the disability due to, tropical diseases. These tropical diseases in the western hemisphere, were chiefly yellow fever and malarial fever. It is astounding to the military sanitarian of the recent day to read of the losses caused by yellow fever to military expeditions in the West Indies. One can hardly believe the loss reported as possible. The English army in the Windward Island n 1794 under Sir Charles Grey, out of a total strength of 12,000 men lost 6,000. The French army in San Domingo in 1798, out of a total strength of 25,000 lost over 22,000 from yellow fever. Again in 1802 the French army in San Domingo, out of a total strength of 40,000 lost 20,000.

During the nineteenth century the United States was so frequently ravaged by epidemics of yellow fever, and such great loss of life and loss of wealth was thereby brought about, that the people were willing to go to great expense or submit to drastic measures for the purpose of getting protection therefrom. It was very evident to sanitarians who had given any study to the matter, that the epidemics which affected the United States were imported from the endemic focus, which had existed at Havana, Cuba, for the preceding one hundred and fifty years. The United States was, therefore, very anxious to get rid of Havana as an endemic focus.

When we came into possession of this city in 1898, as a result of the Spanish-American war, every endeavor was made by the authorities to eradicate yellow fever. The whole attention and force of the Government was centred upon the effort to clean up the city. Yellow fever was then believed to be the best example of a disease caused by filth. In 1900, two years after our occupation, Havana was one of the cleanest cities in the world. At this time I was the health officer of the city under the Military Governor. The authorities were at their wits' ends and knew not what to try. The Cubans were very much inclined to poke fun at us and at our extraordinary ideas on the subject of sanitation.

A distinguished physician of Havana, Dr. Carlos Finlay, had been maintaining for the previous twenty years, that yellow fever was conveyed from man to man by a certain species of mosquito, the Aedes. From the known facts with regard to yellow fever and from the life history of this species of mosquito, Dr. Finlay had reached this conclusion by a most logical and interesting argument. Dr. Finlay has died in Havana within the last month at the ripe old age of 82. He is one of the greatest men in medicine who lived long enough to see his work recognized.

The army board, consisting of Reed, Lazear, Carroll and Agramonte, took up in 1900 the investigation of the question of the transmission of yellow fever by the mosquito. They carried to conclusion one of the most mathematical demonstrations ever accomplished in medicine. They placed men out in the country near Havana, so guarded that it was impossible for them to contract yellow fever from their surroundings. They then took the female Aedes mosquito, allowed her to sting men sick with yellow fever, and then bite the men in this camp. The men bitten developed yellow fever. The investigators then took material soiled by yellow fever patients in every possible manner and had men sleep in rooms filled with this material for weeks at a time. No one contracted yellow fever in this way. This board, as

the result of their labors, published the following very important conclusions:

That yellow fever is conveyed from man to man by the bite of the female Aedes mosquito, and, in nature, is probably conveyed in no other way, and that the disease is not conveyed by fomites of any kind.

The sanitary department of Havana took these important announcements of this board, and worked out the measures whereby they might me made of practicable effect in our fight against yellow fever. We established a quarantine whereby all infected ships or persons coming into the harbor of Havana were cared for; and a system of inspection whereby all such persons coming in by land were looked after. A yellow fever patient was so screened and cared for that the Aedes could not bite him. The attempt was made to kill by fumigating all mosquitoes that might have become infected from each case. And, finally, the attempt was made to destroy all mosquito larvae breeding anywhere within the city limits.

In the long run we found the destruction of the larvae to be of more importance than all the other measures put together.

We commenced our anti-mosquito work at Havana in February, 1901. The last case of yellow fever in the city occurred in September of the same year. Havana had been the great endemic focus of yellow fever for all the northern hemisphere during the preceding one hundred and fifty years. Since the extinction of yellow fever in Havana fourteen years ago, this disease has practically disappeared from the northern hemisphere.

In 1898 Sir Ronald Ross of the English army had demonstrated that malaria was conveyed from man to man by another species of mosquito, the Anopheles. He, and other workers, had established much the same condition as to the transfer of malaria that I have just described with regard to yellow fever. It was evident to the sanitary authorities, therefore, that a very slight extension of the work against yellow fever ought to cover work against malaria. This has turned out to be the case. Malaria rapidly decreased with the inauguration of the anti-mosquito work and has since become practically extinct.

In 1904 our Government undertook the construction of the Panama Canal. On account of the success of the work at Havana, I was placed in charge of sanitation at Panama. For a period in 1905, when yellow fever was at its height, we found ourselves working among a panic-stricken population who believed that we were cranks and fools. Our superiors on the Isthmus at this time had become affected by the prevailing panic and were reporting to the authorities at Washington that our work had failed and were asking that we be relieved, and that men more practical and sane replace us.

This report would have ended sanitary work at Panama along the lines of modern sanitation had it been acted upon.

For the two years succeeding this time we were given the loyal support of our superiors and by the middle of 1907 the work was accomplished. The request for our dismissal was made by the Commission in June, 1905. In September, 1905, the last case of yellow fever occurred in the city of Panama, and only one case has occurred in the Republic of Panama since that time. All health conditions rapidly improved; and soon the Isthmus, as to health, compared favorably with many parts of the United States.

The eradication of yellow fever and the control of certain other maladies was undoubtedly due to the special sanitary measures taken against these diseases. But these special measures could have had no effect upon general health conditions. For the last fifteen years I have given a great deal of thought to this matter. What did we do at Havana and Panama to cause the great improvement in health conditions which took place shortly after our arrival at both places, and has since continued?

At Panama shortly after our arrival we increased the wages of the common laborers from eleven cents an hour to twenty cents an hour. This was nearly four times the wages of the laborer in the surrounding countries. The laborer knew that every fourth man would die each year of diseases prevalent on the Isthmus and it took strong inducements to get him to come at all.

This large increase in wages caused a great general improvement in all living conditions—more room to live in, better

food, and better clothing. I am satisfied that to this improvement in social conditions, caused by our high wages, we principally owe our extraordinary improvement in general health conditions. It is a health officer's duty to urge forward in his community those measures which will control individual diseases, but my long experience has taught me that it is still more his duty to take that broader view of life which goes to the root of bad hygiene, and do what he can to elevate the general social conditions of his community. This my experience has taught me, can best me accomplished by living wages. Such measures tend at the same time to alleviate the poverty, misery and suffering that is occurring among the poorest classes everywhere in modern communities. At Panama we increased wages by the edict of the Government. But our Government got this money by taxing the people of the United States. It would have been of little benefit to our laborers if we had increased their wages by ten cents an hour and then taxed them by ten cents an hour in order to raise this money.

Such would be the result in the United States if we attempted to increase here by edict of the Government as we did at Panama; and such an increase would be of no benefit to the laborer.

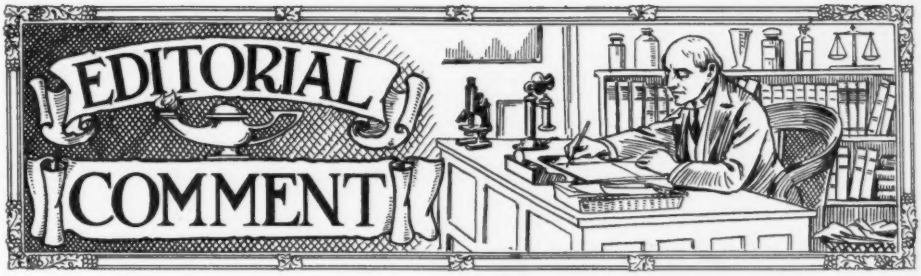
Natural, just and proper wages are what each man produces, not a cent more or a cent less. We can look back in the history of our own country and see that this condition of affairs was approximated in the early settlement of the country. A man coming to this country would take up land for which he paid nothing, and his wages were all he produced on that land. After a while all the land is taken up and the next man who comes has to work for someone else. Later a great many more men come, and these men bid against each other for work, and thus force down wages. This has gone on in the United States, and in all other civilized countries, till at the present time all producers get much less than natural wages, that is, less than what they produce. Can this unfortunate and undesirable condition of wages be rectified?

Suppose an area of land as great in extent, and as fertile in production as the present Mississippi Valley, should to-morrow rise from the bottom of the Atlantic ocean off the coast of Long Island. Suppose the United States should own this island and offer it to its citizens under our present homestead laws. Thousands of the citizens of New York would flock there and take up this land. Their wages would be natural wages. Each man would get all that he produced; this would be very much in excess of the wages now given in New York. All the poverty, sickness and degradation caused at present by low wages would be rapidly ameliorated. The man who was so fortunate as to be appointed health officer for this island would in a few years be able to publish the most astounding health reports.

It is entirely possible for us to raise from the bottom of the sea just such an island as I have described. In every town and county of New York a large part of the lands are unused or only partially used. If this large body of unused land could be brought into use, the effect upon the health conditions of New York would be exactly the same as would be produced by raising the island I have described.

Can these unused lands be brought into use? If these unused lands were taxed to such an extent that the owners would have to use them to the fullest extent in order that they might pay the taxes, is there any doubt as to what the result would be? All unused lands would soon be utilized to their fullest extent. The only way of making any profit from them would be to so use them.

I have been fortunate enough to labor as health officer in a field where very great health results have been produced, but they would be small as compared with the health results produced by securing for mankind natural wages. It stirs my enthusiasm to think of the glorious opportunities before the young health officer just commencing life. I have spent my sanitary life killing tropical mosquitoes, and I hope have thereby benefited my fellowman. I would give a good deal to spend another sanitary life in the ranks of the coming generation of health officers doing my share in the fight that is before us, the fight for the greatest of all sanitary measures, natural wages.



The Factor of Poverty in Sanitation.

The factor of poverty in sanitary problems was discussed in Washington, November 26th, by Surgeon-General William C. Gorgas, whose success in cleaning up Havana and the Panama Canal zone have brought him recognition as America's leading sanitarian. His audience was the Clinical Society of Surgeons, assembled in their twenty-fourth annual meeting. Dr. Gorgas said, in part:

"Such sanitary work as is necessary in the tropics is inexpensive, but measures directed against special disease are not the greatest good that can be accomplished by sanitation.

"Before these great results that we can all now see are possible for the sanitarian, we shall have to alleviate more or less the poverty at present existing in all civilized communities. Poverty is the greatest of all breeders of disease and the stone-wall against which every sanitarian must finally impinge.

"During the last ten years of my sanitary work I have thought much on this subject. Of what practical measure could the modern sanitarian avail himself to alleviate the poverty of that class of our population which most needs sanitation? It is evident that this poverty is principally due to low wages; that low wages in modern communities are principally due to the fact that there are many more men competing for work than there are jobs to divide among these men. To alleviate this poverty two methods are possible, either a measure directed toward decreasing the number of men competing for jobs, or, on the other hand, measures directed toward increasing the number of jobs.

"The modern sanitarian can very easily decrease the number of men competing for jobs; if by next summer he should introduce infected stegomyia mosquitos at a dozen different places in the southern United States he could practically guarantee that when winter came we would have several million less persons competing for jobs in the United States than we have at present. This has been the method that man has been subject to for the last six or seven thousand years, but it does not appeal to me, nor, I believe, to you. This method is at present being tried on a huge scale by means of the great war in Europe. I do not think that I risk much in predicting that, when this war is over and we shall have eliminated three or four million of the most vigorous workers in Europe, wages will rise and for a long time no man will be unable anywhere in Europe to get a job at pretty fair wages.

"But I am sure that every sanitarian would much rather adopt measures looking toward the increase of jobs rather than, as we have done in the past, submit to measures that decrease the number of competitors for jobs.

"I recently heard one of the members of the Cabinet state that in the United States 55 per cent. of the arable land, for one reason or another, is being held out of use. Now, suppose in the United States we could put into effect some measure that would force this 55 per cent. of our arable land into use. The effect at once would be to double the number of jobs. If the jobs were doubled in number wages would be doubly increased. The only way I can think of forcing this unused land into use is a tax on land values.

"I therefore urge for your consideration, as the most important sanitary measure that can be at present devised, a tax on land values."

Improving Cancer Statitics in the United States.

At the suggestion of a number of the foremost American students of the cancer problem, the United States Bureau of the Census has instituted radical improvements in the collection and publication of the statistics of this disease. A special report on deaths from cancer in the United States during the year 1914 is in preparation and will be issued shortly after the first of the year. Inquiries recently received by the Director of the Census having indicated that some misapprehension has arisen in regard to the purpose and scope of this study, the American Society for the Control of Cancer has issued a statement explaining the significance and essential features of this project of the Census Bureau which is thought not only to promise important additions to our knowledge of cancer, but to constitute a noteworthy advance in the registration of American vital statistics.

It should first be made clear that the Census Bureau has not undertaken special research work that will in any way duplicate the studies of existing institutions and laboratories which are investigating the cause of cancer. On the other hand, there should result a marked improvement of our national mortality statistics of this disease in the direction of greater accuracy and more detail. The experience of foreign countries has shown the value of perfecting and carefully analyzing the annual statistics of deaths in order to throw new light upon the cancer problem, which still remains the chief outstanding question in the realm of medical science.

In February, 1914, the American Society for the Control of Cancer suggested to the Federal authorities that the figures of deaths from cancer in the United States Registration Area be published in greater detail, and that instead of being reported under only seven headings, as had been the custom hitherto, they be listed under many more titles according to the part of the body first affected, thus affording opportunity for more exact comparative study. The suggestion received favorable consideration by the Bureau of the Census, and a special report for 1914 was ordered begun by the former director, Hon. William J. Harris, and is now nearing completion under his successor, Hon. Sam. L. Rogers. This special monograph on cancer will consist of tables showing the deaths from cancer, according to the site of the disease, age, sex, color, nativity and marital condition, for the registration area, the several registration States and the usual subdivisions. Figures for white and colored will be shown separately for such counties and towns as have a colored population of 10,000, or at least 10 per cent. of the total. The new plan subdivides the seven titles for cancer in the International List of the Causes of Death into twenty-nine headings referring to the exact site of the disease. For instance, all deaths from "cancer and other malignant tumors of the buccal cavity" will now be reported under the separate subdivisions for cancer of the lip, tongue, mouth and jaw, and similarly with the other groups.

Upon the further suggestion of a prominent surgeon the Census Bureau also planned to increase the accuracy of the statistics by tabulating separately the returns in which the diagnosis was "reasonably certain" and those in which it was "uncertain." In arriving at this distinction a report is classed as "certain" if the diagnosis was confirmed by microscopical examination of tissues, or by surgical operation, or by autopsy. All cases of internal cancer in which the diagnosis was based on clinical observations alone are classified as "uncertain" regardless of any strength of assertion by the physician that the diagnosis was correct. At the request of the Census Bureau an advisory conference, including representatives of the Harvard Cancer Commission, the George Crocker Special Research Fund of Columbia University, the Barnard Free Skin and Cancer Hospital of St. Louis, the New York State Institute for the Study of Malignant Disease, the Prudential and Metropolitan Life Insurance Companies, the American Association for Cancer Research and the American Society for the Control of Cancer, considered the details of the plan and assisted in the formulation of instructions for editing certificates of deaths from cancer in preparation for the special report. To gather the necessary detailed information the Director of the Census has sent over 35,000 letters of inquiry to physicians who

certified deaths from cancer during 1914.

Although a large amount of additional labor has been thrown upon the Division of Vital Statistics of the Census Office by the preparation of this report, it is believed that the trouble and expense will be more than repaid by the result. The improvement of cancer statistics has practical bearings of greater consequence than may at first appear. Indeed, the importance of statistical investigation in arriving at the solution of the cancer problem is likely to be overlooked. Much of the valuable knowledge of the disease which we possess today has resulted from the collection and comparison of statistical data, and this method must be relied upon, side by side with experimental research and clinical observation, to elucidate the baffling problem of the nature and cause of this disease. The publication of this report by the Census Bureau should bring out new and useful information as to the prevalence of *the* disease in the United States and thereby contribute to the better understanding of its controllable features. Such a study as the Census Bureau is making, if continued, should also throw clearer light on the question of whether or not cancer is really increasing. The foremost authorities have repeatedly urged that this question can be scientifically answered only by studying separately the facts in regard to each of the many forms and sites of malignant disease. The Imperial Cancer Research Fund has co-operated with the Registrar-General of England and Wales in a thorough analysis of the detailed figures for cancer of the stomach, cancer of the tongue, cancer of the breast, etc., for successive years. By the progressive action of the Director of the Census similar data as to parts of the body affected on which such studies can be made will now become available for the first time in the official statistics of the United States.

The new plan will not only produce data for the year 1914, but every future year a vast amount of information will be recorded and stored away, and can be compiled and published when the demand warrants. Efforts are also being made further to coordinate the work of the State and Federal statistical offices for the better registration of deaths from cancer and other diseases as well. By the operation of this plan and the mutually supplementary efforts of the national and State registration officials, it will be possible permanently to record and study the extensive American data on cancer mortality, with all the detail required by the most exacting statistical methods.

Canada Life Assurance Company.

The Christmas number of "Life", the well-known monthly publication of this long - established and popular company, reached us too late for notice in our December issue. The covers are artistically designed and beautifully executed, and the reading matter is interesting and instructive. The Canada Life would doubtless send a copy, gratis, to anyone of our readers requesting the same. On page 9 we learn that eight members of the Company's staff in the British Isles, are serving at the front.

MUSCOVITE AND ROMANOV TSARS

By FLORENCE WITHROW

OUR last article dealt with the various Muscovite Tsars, some legitimate descendants of Rurik, others usurpers and pretenders, but finally the Russians elected a ruler of their own race, Michael Romanov (1613-45). Being but a lad of sixteen he was assisted in government by his virtuous father, Archbishop of Rostov, a brave man formerly persecuted by Boris, who confiscated his lands and forced him to become a monk.

The Romanovs were an old noble family who had already given one Tsarina, the first wife of Ivan IV. and who by marriage were connected with the House of Rurik.

The young native ruler ascended the throne amid the greatest enthusiasm of his long-oppressed people, but tranquility was not yet to be theirs for some years. Many districts were still held by the Poles, who refused to recognize Michael, besides the Swedes were giving trouble; however, they were quieted by the Peace of Stolbovo, 1617, formulated by Gustavus Adolphus, who exclaimed "Bravo! Russia is now completely shut out from the Baltic," for where Petrograd stands was then Swedish soil.

A truce with Poland followed and the father of Michael, held captive by Ladislaus, was allowed to return to Russia, where he was appointed Patriarch of Moscow. Michael, who naturally pursued the policy of autocracy assumed by all his predecessors, had constant difficulties with the nobles, who were said to have poisoned his two wives. But these were days of dark deeds and strange mysteries.

Curious as it may seem, Russia became a favorite resort for Scottish adventurers who came either for purposes of trade or for mercenary service. In the body guard of the false Dimitri were many, whose descendants to this day bear queer Russianized Scotch names.

Michael was followed by his son Alexis, a character much better known than his shadowy father. A third false Dimitri arose who was supported by Queen Christina of Sweden, probably for no other reason than to annoy her hereditary enemy, but after a short and inglorious career this imposter met his fate by public execution in the Red Square.

Alexis I.'s (1645-76) reign is notable for many events which effected the future of his great Empire. First came a revision of the judicial codes of Ivan III. and IV. which, if possible, made many punishments more cruel than before. For instance, the penalty for smoking tobacco was to have the nose cut off, perhaps not a bad treatment for the "inveterates" of to-day.

Secondly, the Cossacks became subject to the Russian Government at this time. Their name is of Tartar derivation, signifying robber, for they were of mixed Tartar and Russian descent, and occupied the wild territory south of Russia bordering on Tartary and Turkistan. The Don Cossacks had acknowledged the sovereignty of Ivan IV., but the Dnieper Cossacks held off until the reign of Alexis, since which time they have been intimately associated with the Tsars as their most ferocious and enduring soldiers and personal body guard.

A period of disturbance followed their subjugation, led by a desperado, Razin, who held the country from Novgorod to Astrakhan, but at last he was captured and executed in the Red Square. Alas! What wail and moan have arisen from this bloodiest of city squares in all the wide world!

Valuable acquisition of territory was also an important event in Alexis' reign, and a considerable number of towns came again under Muscovite government. Many of these places, among them sacred Kiev, the old religious centre, had been taken by the Lithuanians in the 14th century and had been nominally annexed to Poland for 200 years. Hence great was the joy of devout Russians to come again into their own and to worship with renewed fervor in their hoary ancestral churches.

While Cossack rebellions were waging on the frontiers grave Patriarchs and priests were warring in words over antique manuscripts and defunct copyists, in an attempt to revise the Greek Church Bible. The result was a schism which exists to this very day among the differing sects of the Russian Church. Some of the clergy arrogated to themselves high social positions and claimed unwarranted wealth, a fact which makes the Greek Church hierarchy even to-day more dominant over its

adherents than that of the Latin Church over its Roman Catholic subjects.

It is interesting to learn that Alexis was a friend of Charles I. and Charles II. of England, and in the mouldy old Russian archives are preserved a number of felicitous personal letters, but there is no record of any communication during Cromwell's Protectorate. Nevertheless, for purposes of trade a British Ambassador resided in Moscow.

The Russian Court at this time was sumptuous beyond description, according to accounts from the pen of Charles II.'s Ambassador. Gorgeous gold embroideries, gem-studded velvets, rare jewels, lustrous pearls, costly ermines and sables bedecked both sovereign and subject, until they were fairly stiff with grandeur.

Alexis, dying in his forty-eighth year, was succeeded by his son Feodore II., whose uneventful reign was short (1676-82).

A crisis now befell Russia which became broken into factions, part favoring the accession of Ivan, the sickly brother of Feodore, and others supporting Peter, the son of Alexis' second wife, Natalia. Had it not been for the commanding influence of Sophia, the clever and ambitious sister of Ivan, he would have been set aside. But with the help of Basil Golitsin, she fomented a revolt of the Streltsi, the royal body guard, causing a sanguinary outbreak which ended in Ivan and Peter becoming joint sovereigns, with Sophia as regent, which authority she held for seven years. A second revolt of the Streltsi was instigated by this unscrupulous woman at the time of Peter's marriage to Eudoxia (1689) but with the skilful assistance of the Scotch mercenary Gordon, Peter entered Moscow in triumph and claimed the throne. Once more the Red Square ran blood in the execution of conspirators. Peter spared the life of his half-sister, Sophia, but sent her to a convent where she was immured for fifteen years. Golitsin, her chief minister and accomplice, was exiled to Siberia and died in pitiful poverty 24 years later, aged eighty. The woeful fate of these unfortunates was simply that of many others throughout the mysterious and blood-stained history of great white Russia.

The imbecile Ivan soon became willing that Peter, his unquestioned superior, although only 17 years old, should reign singly, even though Ivan had three notable daughters, Catharine, Anna and Praskovia, of whom we shall speak later.

This lad, Peter I. (1682-1725), remarkable from earliest youth, was destined to become Russia's greatest monarch. As a child he was fond of mechanics and always industrious, which accounts for his going to Holland to learn ship-building, where at Saardam he lived the life of a common shipwright. To this day is preserved his humble wooden hut and to this shrine came the late Czar and Czarina, who appropriately placed the noble inscription "Czarvitch bow down, for here was cradled the greatness of thy Empire."

After apprenticeship in Holland, Peter went to England and spent three months in the dockyards of Deptford, residing at Sayes Court, the seat of Lord Evelyn, which the Russian Government leased for him. He frequently dined with William III., with whom he conversed in Dutch, his favorite language, and Dutch William honored him by arranging a sham fight at Spithead. On departure the King presented to him a frigate carrying 24 guns, and for this incipient Russian navy Peter engaged some hardy Cornish seamen. Hearing he would not be welcome in Paris, he avoided France altogether and proceeded to Vienna where Leopold I. received him like a long lost brother and literally provided the fatted calf.

On account of a third rising of the Streltsi, the old Muscovite soldiery, Peter hastened home in 1698 and cruelly punished the mutineers, again deluging the Red Square in blood and staining the Kremlin walls with bleeding corpses. After suppressing the revolt Peter's faithful friend and soldier, the Scotch Gordon, died and was given a magnificent funeral. Lefont, his Swiss military instructor, was also honored with impressive burial.

Peter's next struggle was with the Cossacks, who had established a sort of military republic of their own and who now joined Charles XII. of Sweden in an invasion of Russia. It will be remembered that by the treaty of Stolbovo in 1617, Russia had been compelled to surrender to Sweden all her territory on the Baltic and in 1660

(To be continued.)

PUBLIC WELFARE

SAFETY FIRST

The "safety first" idea is a dangerous one except within the narrowest limits. Nothing is more to be feared than fear. Candor, heroism and a kind heart are the first things. They are miles ahead of safety. Put first things first.

All roads to happiness begin and end in your own being, but they travel via the people. "Safety first" is not a motto for heroes. It is for those who grow cabbages and lettuce, because rabbits are too dangerous. Such persons should avoid battlefields, shun responsibility, leave marriage and home and the sweet love of children out of life, for they bring many sorrows.

"Safety first" people take care that they are well-fixed no matter who earns their living. They are true to the ancient ideas, however erroneous. They are silent and look knowing, as if they might turn on a flood of light if they cared to bother. They join the strong political party, yet appear to be tolerant of radical views, showing their moderation by a diplomatic silence, or by making an oracular observation that may mean anything, which actually means nothing, but which the "innocents abroad" suppose to mean much that they cannot quite grasp.

"Safety first" people join a fashionable and orthodox church, never express an opinion on controversial matters, insist on the established order, and mildly discourage new ideas as being disturbing and bothersome. They avoid personal views. A new thought is more explosive than a barrel of gunpowder. They think of Socrates and Bruno and Savonarola—"poor fellows!" If "safety first" people ever have a bright idea they hasten to cover it with a bushel of some sort—a creed, a political platform or some respectable mantle, otherwise, they discard it. They get some sort of a cage for every bird of freedom that dares to chirp in their own souls.

If you do not want to be a coward and time-server, if you want to be an inspiration to happiness and a help to achievement, forget self and personal safety. Make the greatest demands upon yourself. Adopt as your motto: *Never fear.* You will still have room for all the prudence that a strong heart can tolerate.

The greatest of all heroes said one evening: "I have overcome the world." Within twenty-four hours he was hanged as a public criminal. Yet his claim was gloriously true. His motto was: "He that saveth his life shall lose it."—Albert D. Watson.

CANADIAN POETS

XXII

LLOYD ROBERTS

"Mr. Roberts as a poet is fundamentally a word-painter, a nature colorist, rather than a lilter or verbal musician. By this it is not meant that his verse does not appeal by its rhythmic swing and vowel music, consonance, assonance and alliteration. As a verbal musician his rhythms are limited, quite conventional, though not artificial; he employs rhythms suited to his subjects, and he is adept in the use of pure terminal rhymes, assonance, and alliteration, gifted in this respect, somewhat like Swinburne. But essentially Mr. Roberts shows distinction as a colorist, using words with the same beauty and power that a master-painter in oils uses pigments. He is a master of vivid colorful diction and phrase. . . . . Mr. Lloyd Roberts is a genuine poet because he sings with the poet's chief inspiration, namely: ecstasy of delight in the magic and mystery of earth, and in the lust of life. He is a poet of exceeding great promise."—J. D. Logan, Ph.D., in the Montreal Herald and the Daily Telegraph, June 13th, 1914.

BECAUSE of the warm place held in the hearts of Canadian readers, by Charles G. D. Roberts, a first volume of poems from the pen of his eldest son, Mr. Lloyd Roberts, was a matter of national interest.

This volume, "England Over Seas," was issued by the publishing house of Elkin Mathews, Cork Street, London, England, in the spring of 1914, and at once it attracted wide attention. It was soon discovered that the son is as true a poet as the father, possessing the same unerring vision and sureness of touch in nature description, and the same fine mastery of words and of rhythmic effects.

In an excellent review which appeared in The Halifax Herald, I find this passage:

It is the simplicity of statement, the lyric charm and the spontaneous joy of its utterance which make Mr. Roberts' work such a pleasure and a profit to read. This simplicity is obviously Mr. Roberts' ideal, and with such an ideal held steadily before him, there is no distance he may not travel and no height he may not climb to deliver his message to the world . . . Lloyd Roberts comes upon the scene as a writer of true lyric poetry, singing the song of his native land, and with each successive poem fulfilling the promise of becoming one of the waymarks of Canadian literature.

Mr. Roberts was born in Fredericton, N.B., October 31st, 1884. He was educated in the schools of his native city and subsequently at Windsor, N.S. When eighteen years of age, he broke away from the class-room and began his career of self-directed effort. In 1904 he joined the staff of "Outing Magazine," New York, as assistant editor; and later became an editorial writer for "The National Encyclopædia of American Biography." Since then he has done newspaper work in British Columbia and in Ontario, and is now occupied in the Department of the Interior at Ottawa, as editor of immigration literature.

Mr. Roberts has been twice married,—in 1908, to Helen Hope Farquhar Balmain, of England, to whom his first volume is dedicated, and who died in 1912, leaving him with one little daughter, Patricia—and in 1914, to Lila White, of New York State.

The readers of "England Over Seas" will learn with very real pleasure that Mr. Roberts' second volume of verse is likely to appear in 1916.

WINTER WINDS

Like a hard cruel lash the long lean winds
  cringe at the lift of the hand,
Curling over the breast of the hills and
  cutting the feet of the plain,
Till the naked limbs of the forest host
  are laid on the back of the land,
Never a sail on that sharp straight line
  that marks the steel of the sky:
And the white-ribbed waves on the
  granite shore moan and sob in
  their pain.

Never a wing flees in from death to
  crouch in the rattling reeds;
In the shaggy heads of the black coast
  pines the frozen spume drives high;
And even the hand of the leering sun
  lies cold on the tattered weeds.

A month ago and the warm winds ran
  over the stalks of gold,
With the grass-heads wet in the morning
  mists and the daisies topped
  with bees;
And now the last of the year lies dead,
  the world walks bent, and old,
And only the bitter lash of the wind
  sweeps in from the iron seas.

YOUNG BLOOD

They took me from the forests and they
  put me in the town;
They bid me learn the wisdom the wise
  men have laid down,
To put by my childish ways
  And forget my Golden Days,
With my feet upon the ladder that runs
  up to high renown.

So I would not hear the voices that were
  calling day and night,
And I would not see the visions that were
  ever in my sight;
But I mingled with the throngs,
  Heard their curses and their songs,
And raised the brimming glass on high to
  catch the yellow light.

But I was not meant to wander where the
  wild things never came,
Where the night-time was like day-time
  and the seasons were the same;
Where the city's sullen roar
  Ever surged against my door,
And the only peace was battle and the
  only goal was fame.

For my blood pulsed hot within me and
  the prize seemed wondrous small;
And my soul cried out for freedom in a
  world beyond a wall.
Oh, fame can well be sung
  By those no longer young,
By wisdom, age and learning; but youth
  transcends them all!

So I'll let the spring of life well up and
  drown the empty quest;
And I'll watch the stars more bright than
  fame gleam red along the crest;
And taste the driving rain
  Between my lips again,

And know that to the blood of youth the
open road is best.

With Spring-time in the woodlands will
my pulses stir and thrill;
I'll run below the wet young moon where
myriad frogs pipe shrill;
I'll forget the world of strife,
Where fame is more than life;
And I'll mate with youth and beauty
when the sun is on the hill.

HUSBANDS OVER SEAS

Each morning they sit down to their lit-
tle bites of bread,
To six warm bowls of porridge and a
broken mug or two.
And each simple soul is happy and each
hungry mouth is fed—
Then why should she be smiling as the
weary-hearted do?

All day the house has echoed to their tiny,
treble laughter
(Six little rose-faced cherubs who trip
shouting through the day),
Till the candle lights the cradle and runs
dark along the rafter—
Then why should she be watching while
the long night wastes away?

She tells them how their daddy has sailed
out across the seas,
And they'll be going after when the
May begins to bloom.
Oh, they clap their hands together as
they cluster round her knees—
Then why should she be weeping as
they tumble from the room?

The May has bloomed and withered and
the haws are clinging red,
The winter winds are talking in the
dead ranks of the trees;
And still she tells of daddy as she tucks
each tot in bed—
God pity all dear women who have hus-
bands over seas!

ENGLAND'S FIELDS

England's cliffs are white like milk,
But England's fields are green;
The grey fogs creep across the moors,
But warm suns stand between.
And not so far from London town, be-
yond the brimming street,
A thousand little summer winds are sing-
ing in the wheat.

Red-lipped poppies stand and burn,
The hedges are aglow;
The daisies climb the windy hills
Till all grow white like snow.
And when the slim, pale moon slides up,
and dreamy night is near,
There's a whisper in the beeches for
lonely hearts to hear.

Poppies burn in Italy,
And suns grow round and high;
The black pines of Posilipo
Are gaunt upon the sky—
And yet I know an English elm beside
an English lane
That calls me through the twilight and
the miles of misty rain.

Tell me why the meadow-lands
Become so warm in June;
Why the tangled roses breathe
So softly to the moon;
And when the sunset bars come down to
pass the feet of day,
Why the singing thrushes slide between
the sprigs of May?

Weary, we have wandered back—
And we have travelled far—
Above the storms and over seas
Gleamed ever one bright star—
O England! when our feet grow cold and
will no longer roam,
We see beyond your milk-white cliffs the
round, green fields of home.

THE MADNESS OF WINDS

On all the upland pastures the strong
winds gallop free,
Trampling down the flowered stalks
sleepy in the sun,
Whirl away in blue and gold all their
finery,
Till naked crouch the gentle hosts
where the winds have run.
Along the rocking hillsides shaggy heads
are bent;
Out upon the tawny plains tortured
dust leaps high;
The red roof of the sunset is torn away
and rent,
And chaos lifts the heavy sea and
bends the hollow sky.

The winds are drunk with freedom—the crowded valleys roar;
The madness surges through their veins, and when they gallop out
The black rain follows close behind, the pale sun flees before,
And recklessly across the world, goes all the broken rout.

I was striding on the uplands when the host was running mad,
I saw them threshing through the leaves and daisy tops below,
And as their feet came up the hill, my tired heart grew glad—
Till at the music of their throats I knew that I must go.

So the winds are now my brothers, they have joined me to their ranks,
And when their rampant strength wells up and drives them singing forth,
I am with them when they roll the fog across the oily banks,
And tumble out the sleeping bergs that crowd beyond the north.

The woods are drenched with moonlight and every leaf's awake;
The little beads of dew sit white on every twig and blade;
A thousand stars are scattered thick beneath the forest lake;
We pass—with only laughter for the havoc we have made.

There's not a wind that brushes the long bright fields of corn,
Or, shrieking, drives the broken wreck beneath a blackened sea;
There's not a wind that draws the rain across the face of morn
That does not rise when I arise and sink again with me.

RUNNERS OF THE RAIN

Gaunt and black the naked pines are scrawled across the sky;
The wild wet winds are clinging where the hard peaks lift and soar;
They watch our long gray hosts of rain forever marching by,
While up through all the canyons we send our sullen roar.

From every sodden meadow we've trodden out the sun;
We've ground the pale green stalks of grass that lifted through the hills;
Across the yelping torrents a thousand feet have run,
Till waters scream in anger and the wide-mouthed valley fills.

Among the moaning spruces we threshed our heedless way;
And out upon the barrens where the lonely spaces hide,
We stamped the miles of mosses and blackened out the day,
And waked the awful silence where all the winds have died.

The stars flamed brave before us and the greater light hung still
When the white smoke of our breath blew up and drowned the hollow night.
We crushed them out beneath our feet and leapt from hill to hill,
Till east to east the sweep of space was rocking with our flight.

The little walls of man uprose like shields beneath our feet;
We beat upon their hollow cells a million shafts of rain;
Our wild song of freedom was loud in every street,
While down along the slimy wharves the great ships lift and strain.

The dawn pushed pale thin fingers above the flattened sea,
Groping blind white fingers that clawed the shroud of night;
'Till from the straining eddies the pale forms turned to flee,
And a million tongues of madness rose singing through the fight.

Across the quaking marshes we turned and wandered back;
The trapper in the clearing heard the wan thin hosts of rain.
We moved between the steaming trails where all the woods dripped black,
And high among the empty hills we pitched our tents again.

THE FRUIT-RANCHER

He sees the rosy apples cling like flowers to the bough;
He plucks the purple plums and spills the cherries on the grass;
He wanted peace and silence,—God gives him plenty now,—

His feet upon the mountain and his
shadow on the pass.

He built himself a cabin from red cedars
of his own;
He blasted out the stumps and twitched
the boulders from the soil;
And with an axe and chisel he fashioned
out a throne
Where he might dine in grandeur off
the first fruits of his toil.

His orchard is a treasure-house alive with
song and sun,
Where currants ripe as rubies gleam
and golden pippins glow;
His servants are the wind and rain whose
work is never done,
Till winter rends the scarlet roof and
banks the halls with snow.

He shouts across the valley, and the
ranges answer back;
His brushwood smoke at evening lifts a
column to the moon;
And dim beyond the distance where the
Kootenai winds black,
He hears the silence shattered by the
laughter of the loon.

COME QUIETLY, ENGLAND!

Come quietly, England, all together, come!
It is time!
We have waited, weighed, and wondered
Who had blundered;
Stared askance at one another
As our brother slew our brother,
And went about our business,
Saying: "It will all be right—some day.
Let the soldiers do the killing—
If they're willing—
Let the sailors do the manning,
Let the Cabinets do the planning,
Let the bankers do the paying,
And the clergy do the praying.
The Empire is a fixture—
Walled and welded by five oceans,
And a little blood won't move it,
Nor a flood-tide of emotions."

Well, now we know the truth
And the facts of all this fighting;
How 'tis not for England's glory
But for all a wide world's righting;
Not for George nor party power,
Not for conquest nor for dower,
Not for fear of our last hour,
But the lone star of liberty and light.
What the Puritans left England for,
And the Irish their green isle;
What Adolphus pledged his life to,
And Orange took from Spain—
The Spain that Grenville throttled,
And Frankie broke in twain—
What Washington starved and strove for
In the long winter night;
Lincoln wept for, died for—
Do we doubt if he were right?

Ah! It is time, if the soul of these is ours—
Time to put an end to reason
And take the field for right.
They will lead us, never fear it,
They will lead us through the night.
They will steel the soul and sinew
Of the legions of the land;
They will pilot up the Dreadnoughts
With the tillers in their hand—
Hawkins and Frobisher and Drake—
And who would fear to follow
When Nelson sets the course?
And who would turn his eyes away

Not one at home to-day;
From Wellington's white horse?
Not one, I warrant, now—
In England? In Scotland?
In the Green Isle 'eross the way?
No, nor far away to westward
Beyond the leagues of foam—
They are coming, they are coming,
Their feet are turning home.
In Canada they're singing,
And love lies like a flame
About their hearts this morning
That sea-winds cannot tame.
Africa? Australia?
Aye, a million throats proclaim
That their Motherland is Mother still
In something more than name!

It is time! Come, all together, come!
Not to the fife's call, not to the drum;
Right needs you; Truth claims you—
That's a call indeed
One must heed!
Not for the weeping
(God knows there is weeping!);
Not for the horrors
That are blotting out the page;
Not for our comrades
(How many now are sleeping!)
Nor for the pity nor the rage,
But for the sake of simple goodness
And His laws,
We shall sacrifice our all
For The Cause!

Ottawa, Canada, Oct. 1, 1915.

Art and Artists in Canada

By KATHERINE HALE

Nearly all the music that we shall hear in Canada this season is attached, so to speak, to a patriotic purpose, but there was something distinctly unique in the event—initial of its kind in Canada—of a benefit Recital for the first American Battalion preparing for overseas in the cause of the allied nations.

Mr. Cecil Fanning came from Columbus, Ohio, with his accompanist, Mr. H. B. Turpin, to aid in funds for the equipment of the 97th American Battalion, came at his own expense and sang himself gloriously into the hearts of Canadians and Americans alike.

There is, to the mind of the writer, something very bright and wonderful in the atmosphere which surrounds this singer. It was as though one heard a brilliant messenger sent by poet and musician to interpret the dual mission of words blended with the colors of music.

Mr. Fanning's interpretation of songs and arias covers an enormous repertoire, which ranges from ancient and modern opera, through the gamut of ballads, to the folk songs of many countries, and his art is so sincere, and so exquisite vocally as to leave the most hardened critic disarmed of criticism and thankful indeed that youth and poetry are still abroad in the land.

Portrait bust of Mr. Cecil Fanning, exhibited at the Panama Exposition

It is Madam Melba who has said that the art of diction is lost with most singers:

"I think it will be generally admitted as an ideal that the English language should be sung as it should be spoken, with just sufficient added distinctness, or one might even use the word "exaggeration' to counteract the obscuring effect of the piano or other musical accompaniment. You have observed that I have said 'as the English language *should* be spoken.' And I am sure that the thought has occurred to you that the majority of people do not habitually speak the language with justice, distinction and grace. How many persons do you know who could read aloud a verse of poetry, or of fine prose, in a manner to include the qualities mentioned? Not many, I fear, and yet I have a strong feeling that that is what the singer should be able to do before he or she enters seriously into the training of the singing voice. In a word, if verbal diction were early acquired, vocal diction would not be so serious a stumbling block to our singers. Learn to speak aloud with distinction and understanding and so enable yourselves to bring to your singing the added glory of perfect diction."

Perfect diction is the first impression that you get, as Mr. Fanning begins to sing some bit of old opera—an air from Orfeo (1637) was his opening number in Toronto—but soon the beautiful voice itself carries you away, and when a little later on he sings the Prologue from L''Pagliacci, putting the joys and sorrows of that mimic world before you so passionately, so tenderly, with such a wealth of human feeling, you awake to the greatest fact of all—that this young man in immaculate eveningd ress, his little boo kof words clasped in white gloved hands, is really, miraculous though it may seem, that most unusual of visitants on a concert stage—a poet.

In such a grim ballad as Loewe's "Edward," essayed by every baritone who can

produce a rumbling tone and make "frightened faces" (as an infant prodigy, herself rather alarmed at the proceedings, neatly terms it), the very essence of Cecil Fanning's art is felt. As that awful engagement of question and answer between Edward, who has murdered his father, and his old fear-crazed mother, proceeds, the singer gives you its horror, its hesitations, its sickening affirmations, not in "frightened faces" or in gestures, or even altogether in the wonderfully modulated voice, so flexible an instrument that it portrays the heat of youth and the trembling tones of miserable old age to the life, but, apart from the voice itself, there speaks the very soul of the singer which has visualized, nay, more, almost consciously lived that tragedy before putting it into tone form. You are absolutely cold with horror, by that same sense of conviction with which Sarah Bernhardt compels you to die with her.

I remember on a spring day in Paris asking an old resident and habitue of "Le theatre Sarah Bernhardt" to take me to see "La Divine" in one of her most poignant roles. And my friend assured me quite seriously that Sarah was shortening her life (my friend's) quite too rapidly, and that a spring day was no time to look upon the face of death.

"But it is all art, not actualtiy—for Sarah at least!" I was very young and sure.

"It may be," said the older woman reflectively, "but to some of Sarah's listeners it is very actually life—or death."

No one who has lived at all can see, hear or feel supreme art without this instant responsive sense of conviction. It is the artist's eternal sesame to the hearts of his hearers. And so Cecil Fanning can torture your very soul with his "Edward," only to release you again to stars and quietness, with some lovely Nocturne or Chinese River Song, or a "Spring-Tide" by Greig, and he brings you close to dancing, budding heady life in "Le Cycle du Vin," an old French folk song in which he imitates, with voice and gesture, the happy life of the vineyards; the blooming and ripening of the grapes, the gathering, the treading of the winepress, and the laughter and drinking of the wine.

In these folk songs his art is clearest and most triumphant. People have sometimes likened Mr. Fanning to Dr. Wullner, the great German leider singer and exponent of folk song. They are doubtless of the same school of thought, but already the younger outsteps the older man. He is more flexible, versatile, human and, to use a rather uncanny word, mediumistic. One might substitute poetic, if it were not the hardest driven and most misunderstood adjective in the language.

Mr. Fanning owes much, and gladly acknowledges the debt, to his teacher and accompanist, Mr. H. B. Turpin, who, as he himself tells me, "saw, early in the game, that Cecil was a wonder," and has nourished, and at the same time wisely let alone, that strange "difference" that sometimes means genius, taking care that the voice production became as perfect as possible and letting his pupil develop his own ideas and interpretation. A beautiful friendship has grown up between this master and pupil who have together toured America and Europe, and to the older man there must be a world of satisfaction in thus experiencing the harvest of beauty that he has sown. It is only fair to add that the most considerable triumphs of his pupil have occurred in Europe.

In his Toronto concert, Mr. Fanning introduced an exquisite song based on George Macdonald's well-known lines beginning "Where did you come from, baby dear?" set to music by one of our own composers. Dr. W. H. Gutzeit, a work of remarkable delicacy and beauty. A fact which is little known to the public is that Mr. Fanning has himself written some charming tone poems, among them the "Pipes of Pan" (music by Lulu Jones Downing), "The Princess Lontain, and "A Sicilian Spring," which is still in the manuscript, but will shortly be published.

I am glad to call attention to a timely utterance in a little paper, "Vibrations," published by the Canadian Academy of Music, on the iniquity of Toronto audiences as regards punctuality. "If a concert in Toronto," says the writer, "is advertised to

start at eight-fifteen and begins at eight-thirty, it deserves commendation for promptness; in fact, it is no unusual thing to attend a performance which is half an hour late in starting. Now this unfortunate fashion has pernicious results, and the whole spirit of a performance may be materially affected by the feeling of dubiety which this bad habit engenders. The artists are in two minds whether to proceed with or delay the programme. If they make a start they will offend late-comers, and if they do not start they are guilty of rudeness to the assembled audience; when they really do get going they have the uncomfortable sensation that many are missing one of the most important items on the programme. If the advertised time of starting a concert is found to be too early for the majority of concert goers, why not alter the hour to suit them? This would appear to be a simple remedy, but it is doubtful whether it would have the desired effect. The opportunity to reserve seats, intended as a convenience for the public, may through flagrant misuse become a nuisance.

We hope that soon our concert managers will ask for the approval and support of the public in a common effort to eliminate such vexatious and needless delay.

The Music of the Reeds, by Mr. F. McGillivray Knowles

A well known singer has said that the really first-rate accompanist is the biggest asset in a singer's success next to his own magnetism. He is in all essentials the blood-brother, not the servant of the singer and has often pulled the latter through when without him he would have failed dismally. But to attain this level the accompanist must have, what is just as much a gift as voice or "magnetism" itself, a real genius for his work. Without that all the efficiency in the world is of little avail.

One of the most unusual experiments in studio life that has ever been attempted by artists is that of Mr. and Mrs. F. McGillivray Knowles, of Toronto, who will shortly embark on a studio yacht to cruise the inland waters of Canada and the United States, and continue their work under the influence and inspiration of changing scenes and environment.

No real artist has ever been born without der wanderlust as part of his heritage, and surely this longing has never been more ideally met than in the plans which are just reaching completion with Mr. Knowles. The power yacht "Ariel," which he has just purchased from a Philadelphia manufacturer, is fitted up with living room, studio, bed-rooms and kitchen. It is 80 feet in length and will accommodate four serving men as well as its owners. It will fly a most delightful private ensign. Mr. Knowles having discovered that the Chinese character meaning Art resembles the letter "K" just sufficiently, and with sufficient difference, to make its use interesting. Mr. and Mrs. Knowles will leave Toronto a little later in the year for New York and will then "move north and south with the sun." In cold weather they will be far down the Florida coast, stopping at many cities and towns on the way, and will come north with the warm weather, probably spending the summer months in Canadian waters.

One can imagine the interest that this picturesque journey will arouse in most Southern and Northern cities where the artists will stop to work and exhibit their pictures. The expedition will be hailed as "Arcady and Art," "Pleasure and Painting," "Beauty and a Barge," a half dozen headings at once suggest themselves as springing to the pen of the many American reporters who will throng the good yacht

"Ariel." The mistress of the barge, in her Oriental beauty, will cause a stir as surely as the fascination of her work, and that of her husband.

Mrs. Knowles is a poet, and poesy shines through every delicate conception that she has put on her canvas; whether a peaceful pool by moonlight, soft-voiced trees against sunshine, or looming into the dusky twilight, garden pictures, or the fluffy and fascinating forms of her famous little ducks and chickens. These latter, one may say in passing, are already becoming prime favorites in the United States, where her miniatures are appearing and taking awards at exhibitions in New York, Washington, Philadelphia and other cities.

The work of McGillivray Knowles covers a wide field. Some of the most sincere and strongest portraits ever done in Canada have come, of late years, from his studio—notably those of Chancellor Burwash, of Victoria University, Mrs. H. A. Massey, Mrs. Farnham Barton and others. In marine work he is a master. In vast expanses of water he seems to feel the beat and expression of eternal tides. His typical Canadian work, such as a great canvas depicting British battleships in the River St. Lawrence, lying outside Quebec at the time of the Ter-Centenary in 1908, or a bit of quiet country, in sunshine or shadow, is faithful in detail and pervaded by a mature and, in every sense of the word masterly, art. He paints a European street scene with the same surety and shows a vivid joy in color, which has been just before companioned by a knowledge and feeling for the effect of grey skies and hazy outlines. In another moment you are caught by a symbolic human figure depicting some phase of the emotional life of men and women in a way that brings with it realization of another phase of power. Indeed, it seems to me that the fascination of symbolic work is fast growing upon this artist. It offers a wide field to a mind intensely analytic and philosophic, and this will, I believe, gradually work itself into pictures in which the world may read bits of history and evolution translated by a ripened philosophy, which holds within itself a world of suggestion.

I asked Mr. Knowles for the key to his amazing versatility and he answered carelessly. "Oh! I should put it down to the study I have accomplished around many different subjects and phases of art—experience, if you like, coupled with close analytic observation and the ability to work it out technically."

Most of the valuables in the Knowles studio: pictures, wonderful rugs, brasses gathered from many parts of the world, Chinese vases, porcelains and old furniture, are to be sold before the departure of the artists from Toronto, and on their disposal of the well-known studio in Bloor street the door will be closed on much important class work and individual work, and on a social centre which has been for years warm and wide-reaching. Mr. and Mrs. Knowles have always kept "open house" in the best sense of the word. No student, hungry for beautiful things, either under their influence or a stranger to them, has ever gone homeless or unfriended if they could help it. Musicians have loved to make music in an environment which brings out the happiest and best in art, and men and women who care for these things have found here a congenial meeting place. One can only hope that the fate which takes these two most successful members of the art colony of Toronto wandering for a time will bring them back, for long visits at least, to the city which owes them much and is justly proud of their work.

By all means the most interesting dramatic engagement of the last month of the year was that of the Granville Barker production of a fable play by Bernard Shaw, "Androcles and the Lion," preceded by the comedy of "The Man Who Married a Dumb Wife," translated from the French of Anatole France by Curtis Hidden Page.

Of the latter the best that can be said is that it is most quaintly set, though more in the fashion of an Italian play of the fifteenth century than that of Paris at any era, but charming, colorful—mediaeval in texture if not in spirit.

One of the Six Original Jokes which include the Bad Little Brother, the Mischiev-

ous Mother-in-law, and the Talkative Wife is unblushingly "worked" for all it is worth, and the solemn pronouncement at the end that nothing on earth, or in the heavens above, can stop a woman's tongue is met with gales of joy by the audience—joy as fresh and spontaneous as though such an idea had never been presented before. All of which speaks volumes for the excellent setting and costuming of the play.

The old fable of the little Greek Tailor, Androcles, who loved animals even a little more than human beings, and, having made special friends with a lion through extracting a thorn from his paw, has the satisfaction of finding his friend faithful in a crisis of an exceedingly delicate nature, will be recalled by the play which Bernard Shaw has adroitly written about the theme. The story reveals the conditions existing in the Roman Empire at the time of the Christian persecution and has to do with a little band of Christian martyrs of whom Androcles the Gentle is determined to be one. Because he loves God's lowliest creatures so much he must prove his loyalty to the peasant Christ who loved them too.

Ferrovious, a huge son of Mars, wishes to die that he may prove that the soul is greater than the sword, Spintho, a moral weakling, is willing to be cast to the lions in order to show that anyone can be "saved" Lavinia, a noble lady longs to "perish for an ideal"—all these people, as intensely human characters of to-day as of centuries ago, stand out against a simple and most effective background and when they are all delivered from the lions because Ferrovious forgets to die when he sees a good chance to kill a half dozen gladiators, and the wildest lion of the lot refuses to eat his old friend "Andy" none are so relieved as the martyrs themselves. Though they are really a much more jolly and sensible lot than one would have pictured them without the help of Mr. Shaw.

The plays, which are wonderfully well staged and acted were produced at the Royal Alexandra, Toronto.

The Great Consulting Room of a Wise Man is a Library—Dawson

YOUR BABY: A Guide for Young Mothers—By Dr. E. B. Lowry—Forbes & Co., Chicago—$1.00 net.

Most parents know more about hens and horses than they do about children. Babies are reluctantly begotten in self-indulgence, by parents mated for convenience. They are ignorantly clothed and fed and allowed just to grow up like Topsy. The word with which most children are best acquainted is the word "Don't."

If the mother who reads this feels sententious about these statements, it is probably because she is herself a sterilized splendor and has no babies, or else she rears her children by the micrometer method, which is if possible worse than the Topsy method of letting the child grow up like a burdock.

Every normal woman longs to be a mother. If she gets no wholesome instruction about motherhood there are endless dangers to which she is exposed and she is liable to at least "fifty-seven varieties" of pitfall. Her baby is liable to as many more. This author has devoted space to the guidance of the young mother both during the period of expectancy and also during the actual experience of child-bearing and after.

In this volume, the child's interests are presented throughout his early years, and it is doubtful whether those who desire a simple guide for the untrained mother can find a better. Probably no better has been written. It is different from other volumes on the same theme, chiefly in that it does not deal minutely with details beyond the capacity of those who have not had the training of a nurse. Our author covers the usual field of care and feeding in a practical way. This book is worthy of a large sale.

A. D. W.

IN a little volume which justifies its name of "Brevis" (The Busy Man's Physical Culture), one is offered an exchange of three minutes of time each day for perfect health. The idea of the author—R. C. Wright, of McPherson, Kansas—is that the secret of good health is proper blood circulation, and that three minutes of exercise a day is enough. Fifteen different exercises—just enough and no more to wake up all the muscles of the body each day—are given, and they can all be done in a very small space and without apparatus. The little volume is concise and in its way scientific.

MATTERS MILITARY

WAR AND SANITATION

By Sir JAMES CREIGHTON-BROWNE on the Results Achieved by the Sanitary Service

Sir James Crichton-Browne, in his presidential address to the Sanitary Inspectors' Association in London on Friday last, reviewed in that forceful style which characterizes his eloquence the work which has been carried out by the medical and sanitary services in the war. The Sanitary Inspectors' Association, which is, he states, 1,500 strong, composed of men holding assured official positions and of an average age greatly limiting the possible number of recruits from its ranks, has given to the combatant branches of the army one lieutenant-colonel, one captain, seven lieutenants, sixteen sergeants, twenty-seven corporals, thirteen privates; and six men attached to the cavalry, the Flying Corps, the Royal Engineers; and to the Sanitary Department of the Royal Army Medical Corps it has given one captain, one lieutenant, fifteen sergeants, thirty-one corporals, and forty-four privates, that is to say, 163 in all.

When the history of the war came to be summed up in the clear light of futurity, we would not be surprised if the verdict, as regards this country, was that it was saved by sanitation. It was on an adequate supply of men that our victory depended, and we could only keep up that supply because we had set our sanitary house in order. But for the enormous advance that had been made in sanitation in the last half-century, more especially in the last ten years, we would now, he thought, be in a perilous plight in France and the Mediterranean. The number of army rejections was proportionately much higher in Germany, Austria, Russia, and Spain, in all of which countries sanitation was much less advanced than with us. In the South African War sickness was responsible for a loss of 80,000 by death and invaliding. In the present war, with troops operating in regions which had often been ravaged by plague, and cholera, and fever, it was so far, reassuring to know that with a larger army than we had ever had in the field, the incidence of disease in it had often been lower than in times of peace. For this unprecedented healthfulness of our army and, therefore, its sustained fighting power, so admirably devised by the Royal Army Medical Corps, and so admirably carried out by the sanitary units acting under it. Among the special measures was antityphoid inoculation, the protective power of which was now beyond question. Causing only temporary inconvenience and practically free from risk, it did not confer a complete life-long immunity, but it was a method of prophylaxis, applicable to aggregations of men, of the utmost value. In bodies of men, protected and unprotected and exposed to the same risk, the chances of escape

from disease were five and a half times greater for the inoculated man than for the uninoculated man, while the chances of recovery in case of an attack of the disease were ten and a half times greater for the former than for the latter. The latest returns from our western front report 606 cases of typhoid, 109 in inoculated and 497 in uninoculated men, and 50 deaths—one in inoculated and 49 in uninoculated men.

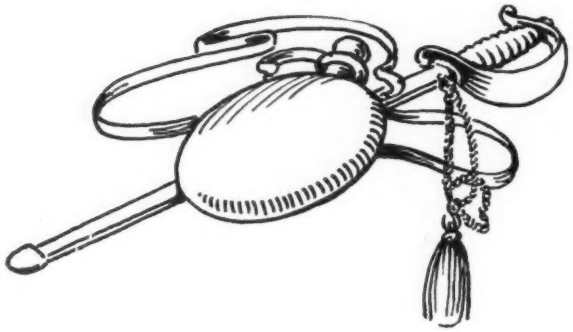
So convincing is the evidence in favor of anti-typhoid inoculation that it has been made compulsory in the army of the United States. With us, unfortunately, it is still optional, and therefore affords a happy hunting-ground to those mischievous beings born with twisted intellects and hypertrophied self-conceit, who are always "agin scientific truth," just as the discontented Irishman was always "agin the Government." It seems to me, he said, that you may do much to counteract the evil done by these dangerous lunatics, who, with insane cunning, lure some of our poor soldiers to their destruction. "You speak, considering the office you hold, with some authority on health questions, you are in your billeting surveys brought constantly into personal contact with soldiers, making ready to go to the front, and a word from you may have a salutary effect."

Sanitation in the field is clearly a function of the Royal Army Medical Corps, and must be under its direction and control. It should be constituted a distinct department under one of the directors of the Medical Services. It is as distinct a branch as Transport or the Flying Corps, and should be recognized and organized as such; and composed of men specially trained in all duties relating to the provision of a pure water supply, to field conservancy, and disinfection of food. Every army medical officer is supposed to be a sanitary officer, but in practice it has come about that certain officers of approved fitness have been selected for special sanitary employment. During the present war an entirely new formation has been constituted, known as Divisional Sanitary Companies, composed of a specialist sanitary officer, who is in command, about twenty men trained as sanitary inspectors and foremen, and thirty laborers, who may be augmented in number as occasion requires. But if formations of this kind are to be kept up in war and prove efficient, then the men who compose them must be educated and trained in time of peace, and therefore it would seem that henceforth we should have an Army Sanitary Corps, with superior officers drawn from the Royal Army Medical Corps, but with a number of commissioned officers who have been sanitary inspectors, properly housed and properly furnished with apparatus and properly remunerated. Such a corps would be a nucleus capable of immediate expansion in war time, and constantly supplying sanitary squads or sections to our troops abroad. "Just as the non-commissioned officer is the back-bone of the British army," Lieut.-Col. Andrew Balfour, now directing a much needed sanitary campaign in Gallipoli, has said, "so should the well-trained, certificated, sensible, honest, and energetic sanitary inspector be the backbone of sanitation in our tropical colonies and dependencies."

Upon the whole it is believed that the co-operation of the civil sanitary with the military authorities has been cordial and effective, but it is undoubtedly felt by the best informed that it might have been better had the whole sanitary service of the country been taken over by the Local Government Board for the war, and allotted by it in accordance with the varied and constantly varying requirements of different districts. Much waste of energy would thus have been spared, and the services of those sanitary inspectors who have joined the Royal Army Medical Corps might have been more fully utilized. There has, undoubtedly, been considerable dissatisfaction felt by some of the members who have joined the sanitary companies of the Royal Army

Medical Corps, as to impediments placed in their way by the want of complete co-ordination between the civil and military authorities, resulting in failure to secure the scrupulous cleanliness that is desirable, and the thoroughness that is essential in the extermination of vermin. The employment of mere novices in food inspection to the exclusion of men long experienced in that work, and the employment of skilled sanitary inspectors in doing the routine work of orderlies has led to heart-burning. On the other hand a number of sanitary inspectors have borne testimony to the gratifying nature of the reception given to them by the military authorities, and a number of military officers have signified their high appreciation of the assistance given by sanitary inspectors in the laying out of camps with their water supply, in conservancy arrangements, in billeting, and in other ways.

Bacteriological examination of the water supply was carried on at the front, motor laboratories having been provided. So ingeniously were they fitted up that they were capable of carrying out a full chemical and bacteriological examination, and they moved from point to point along the line. When unsafe or doubtful waters were discovered they were dealt with by a new and promising process of purification which was the outcome of experimental work done just before the war. A number of men at the front, who had been detected as "typhoid carriers," had been ferreted out by the Royal Army Medical Corps and sent home. As for fly catching, it had ben raised to a fine art, but there was still room for ingenuity in our confliet with the "ubiquitous pestiferous audacious little black devil."



The Sanitary Inspectors' Association of Western Canada

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MODERN METHODS OF SEWAGE DISPOSAL

Read before the Winnipeg members by the late F. J. Johnson, A.R.S.I., Superintendent of Scavenging, Winnipeg Health Department

IT IS IMPOSSIBLE within the compass of this short paper to give even an outline of all the subjects that come under the heading of "Sewage Disposal," I have therefore endeavored as far as possible to confine myself to the more important practical points, which the limits of time and space of such a paper will allow. It would be quite possible to write a separate paper or many papers on each of these points without even then exhausting the particular subject in question.

In the year 1857 a Royal Commission was appointed in England to inquire and report as to the best mode of distributing the sewage of towns. Many years previous to this, however, sewage was treated in various manners in order to try to eliminate its objectionable features as far as they were known at that time.

Definition of Sewage.

Sewage is defined by Dr. H. Marshall Ward, of Cambridge University, as: A mixture containing a large quantity of water holding in solution certain organic bodies obtained both from animals and plants; containing certain quantities of salts and of animal excreta like urea, and especially vegetable remains like cellulose and certain solid debris of animals and plants; and mixed with these, products of their decomposition in various stages of simplification, as they are breaking down into simpler and simpler things. Then there would be contained larger or smaller quantities of gases, such as carbon dioxide and ammonia, and bodies of a similar nature, in fact, the products of decomposition of animal and vegetable nitrogenous and non-nitrogenous bodies.

As soon as the sewage from the domestic dwelling, the factory, or from any other source, enters the street sewer, certain changes, both chemical and biological, begin to take place. Fermentation (in the broad sense of the word) commences. This leads to the breaking down of nitrogenous bodies, and in the end to the breaking down of the bodies thus produced into quite simple constituents, like carbon dioxide, ammonia and water, and indeed some of these, ammonia especially, being eventually altered; and then fermentation of bodies like cellulose, of which of late we have come to know something, which are broken down into partly gaseous and partly solid constituents, carbon dioxide and water in the end. In fact, the complex bodies which formed the original sewage are no longer recognizable, having broken down by the process of fermentation and the action of living organisms into quite simple bodies.

Most of these changes are brought about by the action of fungi and bacteria, mostly the latter. The action of these fungi and bacteria is that of scavengers. It is not difficult to make a calculation which shows the great probability that in a finite time the globe would be quite uninhabitable if it were not for this scavenging action. I will not attempt to describe the thousand and one changes that these bacteria produce in their action on sewage, but I will endeavor to describe what is generally believed to be their mode of working.

These organisms, many of which have been identified by bacteriologists, feed upon the products of the breaking down

of the complex nitrogenous and other organic bodies found in their environment, and in doing this they destroy a great deal more than they want, a great deal more than is directly utilized for their present needs; so that a bacterium, for instance, may be looked upon as excreting something which attacks, and begins to break down a mass of organic material, as then taking up some of this into its own substance to build up and add to its own weight and during that change it, as it were, unlocks the complex substance that it is attacking, and it falls to pieces in various ways. But the sum of it all is a process of change brought about only by a living body, and that is in the broadest sense what is called fermentation. The attempt has been made to separate artificially putrefaction from fermentation, and to restrict putrefaction to the breaking down of those complex nitrogenous animal and vegetable bodies; and also to try to distinguish between putrefaction which gives off no evil odors, as decay, and putrefaction which does give off evil odors. But an examination of the whole subject shows that no such lines can be drawn. Putrefaction is merely a particular case of fermentation, and the most comprehensible definition of fermentation is "Changes produced in various bodies by the action of living organisms."

There are two distinct forms of fungi and bacteria that influence the decomposition of sewage; aerobic and anaerobic. Most known organisms, fungi and bacteria included, must have oxygen, must have air for respiration, just as an animal must. They cannot live without a partial pressure of oxygen which is comparable to that in the atmosphere. But Pasteur discovered in 1861 that certain fermentations were brought about by organisms living in the depths of liquids where it was absolutely impossible that there could be any oxygen, and on working the matter out, Pasteur showed that these organisms not only can ferment in the absence of air, not only can live without oxygen, but that they cannot do their work in the presence of oxygen. These organisms are known as anaerobic. So that at one extreme we have organisms that do their work with the full access of air and others in the absence of air, and between them are forms which require that the oxygen shall be at a certain partial pressure. And so we have these cases of aerobic, anaerobic and partially aerobic organisms.

In addition to these there is an extraordinary physiological class of bacteria, still a small one, but very well known in some cases, which are what we now call facultative anaerobic. That is to say, if you grow them in one source of food supply they will do without oxygen and will carry on their fermentation without oxygen. If you then grow them on another kind of material, say nitrogenous material, whereas the last one was a material containing sugar, you must give them a supply of oxygen, so that they can be either aerobic or anaerobic, according to circumstances, and they are therefore called Facultative anaerobic. Some of these organisms are: Bacillus putrificus coli; Micrococcus urea; Streptococcus liquefaciens coli; and many others.

As a matter of convenience it is customary to speak of the natural purification of sewage as bacterial, yet bacteria properly so called are not the only forms of life which are concerned in this work, a part of which, moreover, is effected not by living organisms themselves, but by certain products which they throw off.

A great number of changes, most of them hydrolitic, are accomplished by the large class of organic substances termed "enzymes," which, though not living, are products of animal and vegetable life. The enzymes have been defined by Lehmann and Newmann as chemical bodies, which in minimum amounts and without being used up, are able to separate large amounts of complicated organic molecules into simpler, smaller, more soluble and diffusible molecules. The definition is not quite accurate, as the milk ferment, for instance, actually coagulates casein, or renders it insoluble, but it gives an idea of the immense power that these enzymes possess, and the economy of their use as distinguished from ordinary chemical or mechanical means. Their importance to us is shown by the fact that a large number of them are the products of bacteria or other fungi, and are powerful agents in their resolving action. By their means a bacillus is not only able

to act in its immediate neighborhood, but also at a considerable distance, through the soluble ferments it forms and disengages.

The enzymes are soluble nitrogenous bodies, which can be precipitated and rendered inert by strong alcohol, mercuric chloride and by boiling. They can be separated from bacteria by filtration, when the soluble enzymes pass through, while the bacteria are retained. Other distinctions from the organisms which produce them are:

1. Enzymes can work at a greater range of temperature, it being quite possible to find temperatures which will inhibit, if not kill bacteria, without affecting enzymes.

2. Antiseptics like chloroform, thymol, etc., which kill or inhibit bacteria, do not prevent enzymes from acting.

Salkowski innoculated fibrin with putrefactive bacteria and kept it in chloroform water. It remained sterile for an unlimited time, but nevertheless underwent solution with the usual products due to an enzyme secreted by the bacteria at first.

I have purposely dealt somewhat at length on the prominent and important part played by the action of fungi and bacteria on sewage, for it is on their action that the whole problem of modern sewage disposal is based. It is one of the most interesting though delicate and difficult problems of modern science, and our knowledge of these actions is by no means as yet complete.

The lack of knowledge of the inner working of bacterial purification of sewage has at times been urged as a ground for hesitating to adopt bacterial processes and revert to the land treatment, but it probably did not occur to the sapient propounders of this view that our knowledge of the action which goes on in the course of purification by land is no more complete than in the case of the bacterial process. The main point is that quite sufficient is known of the conditions which are essential to effective biological action to warrant us to construct bacterial filters, etc., with a reasonable prospect of success.

Before passing on to the biological treatment of sewage, I will touch briefly on the subject of land treatment. This class of treatment is practically of no use to us in the Middle West, as the long periods of extreme frost that we experience would render land treatment absolutely impossible.

There are two methods in which land is employed for the purification of sewage: intermittent filtration and broad irrigation. In intermittent filtration the land is laid out in lots with banks all round, and the sewage is run upon these plots, and after a charge has been put upon the plot the sewage is allowed to stand until it filters away, when it is again charged.

In broad irrigation the sewage is allowed to run over the ground continuously and to gradually disappear by percolation and evaporation.

There are all kinds of intermediate treatments between these two, such as broad irrigation with sub-drainage; broad irrigation with cultivation; intermittent filtration in made-up soils and many others.

Before turning the sewage upon the land it is usually screened to remove such refuse as paper, rags, vegetable and animal matter, and other large materials that would tend to clog the pores of the soil.

The most suitable soils for land purification of sewage, in order, are as follows:

Light loam overlying gravel or sand;
Heavy loam;
Chalk;
Peat;
Clay.

Gravel is also a good medium providing that it is not too porous. If it is too porous the sewage is not arrested for a sufficient time to enable proper bacterial action to become effective.

The quantity of sewage that can be treated on a given area of land varies considerably. It depends entirely on the nature of the land, the methods employed, the efficient supervision, the nature of the sewage, and the average rainfall.

There are several other matters relating to land treatment, such as cropping, nuisances, etc., but they are of very little interest to us locally, as sewage farming

in Manitoba (excepting for a short period in summer) would be out of the question.

Preliminary Treatment.

It is universally agreed that some form of preliminary treatment is needed before turning sewage upon the filters for final treatment. Many of the failures at first were no doubt due to the clogging of filters with unscreened or untreated sewage and from the lack of proper bacterial action in the sewage.

There are at least four modes of preliminary treatment that are in general use, namely, screening, chemical precipitation, the septic tank and the cultivation tank. The process of screening requires no description, so I will pass on to the next in order, chemical precipitation.

The deposition of the solid matter in sewage is often assisted by the addition of chemicals. The action which takes place is different from ordinary chemical precipitation, the object of which is to throw down in solid forms substances that are in solution, in that the action of the chemicals is directed wholly or mainly to the settlement of the solid particles already present as such in suspension.

That precipitation is an efficient means for freeing sewage from solid matter is recognized on all hands, but considerable difference of opinion has been manifested as to whether or not any appreciable portion of the dissolved matter is removed thereby.

For efficient precipitation, tanks of a large capacity should be used. They should hold at least two-thirds of a daily flow of sewage and, better still, a day and a half's flow. They should be constructed on the quiescent and not on the continuous flow system. This gives a more favorable average sample of sewage for treatment.

The chemicals most commonly used for precipitation are clay, carbon, blood, lime and salts of iron and alumina.

If the sewage is alkaline more acid is used to neutralize it. If too acid some alkaline is added.

The methods employed by the Native Guano Company, manufacturers of artificial manure, is as follows:

The sewage is treated by a mixture of clay, carbon and blood. This is added in a pump well before the sewage is lifted to the tank level. These substances act as purifiers and deodorants. Subsequently a solution of alumina is added in the channel leading to the tank. The exact proportions in which these substances are added to the sewage vary with the strength of the latter. At Barking, where the North London sewer is emptied, it consists of about 50 grains per gallon.

There is one point of view which is a hindrance to subsequent purification of the sewage, that is, the removal of the micro-organisms by the action of the chemicals. This is specially noticeable where lime is used, the absence of nitrification in the filters being very marked. If, however, the amount of chemicals used is apparently small and proper care is taken in introducing them, no appreciable antiseptic action is evident.

It is very doubtful whether the chemical precipitation of sewage is beneficial or not. It removes only the solids in suspension, and as these are easily removed by screening, there is the loss of the cost of chemicals. As these solids only form about one-seventh of the total solids in the sewage, and as they are the least offensive, very little benefit is derived from precipitation unless there is a ready market for the resultant sludge. Unfortunately this product is generally looked upon as a necessary evil, to be got rid of at a minimum of trouble and cost. The general value to an agriculturalist being 1 shilling per ton in England, and in many instances it has to be destroyed at no small expense.

After precipitation it is necessary that the sewage receive further treatment, for so long as the sewage is not actually sterile and so long as solids remain in suspension, it is subject to changes brought about by bacteria, and unless the chemicals used for precipitation are of such a kind as to inhibit bacteria and are added in such quantities as to do so immediately, a certain amount of purification will inevitably occur, not, however, by reason of the addition of the chemicals, but rather in spite of them. This treatment I will speak of further on, under the heading of Contact Beds and Filters.

The next form of preliminary treatment we will consider is what is known as the cultivation tank. This system was in

vented by W. D. Scott Monerieff in 1891. It consists briefly of a chamber filled with large stones carried by a grating, into the space under which the sewage is admitted, and through which it passes slowly upward, escaping by an overflow at the top. The object of the stones is to afford a resting place for the anaerobic organisms by which the solids are liquified. This tank has proved very effective in many instances, especially when dealing with small quantities of sewage. The writer of this paper had the pleasure of designing and supervising the installation of one of these tanks close to Winnipeg some seven years ago, to handle the sewage from a house occupied by 19 persons. He saw this tank a year ago and up to that date it had never been cleaned out, and the effluent had no appreciable odor at that time. The space under the grating in this tank was less than six cubic feet, and would obviously have filled up long ago but for the liquifying action that had taken place. The medium used in filling this tank was hard coal.

(To be Continued.)

MONTHLY JOTTINGS

The Manitoba Branch members have settled down to a steady winter's work. From the syllabus of the meetings given below it will be seen that every branch of sanitary work is well represented. The opening meeting was held in the Council Chamber of the City Hall, and the addresses given by the Mayor and Dr. Douglas, the Health Officer, were most encouraging.

Syllabus for 1915-1916 for the Manitoba Branch.

Oct. 9—Opening addresses by His Worship Mayor Waugh and Dr. J. G. Munroe, Chairman of Health Committee.

"Infection and Immunity," Dr. W. J. Sharman, City Bacteriologist.

Oct. 16—"Sterilization of Milk," F. Lutley, Creameries Inspector.

Oct. 23—"History of Winnipeg's Water Supply," T. H. Hooper, Superintendent of Water Works.

Oct. 30—"Diphtheria — Institutional Outbreaks," W. J. T. Watt, Chief Inspector Communicable Diseases.

Nov. 6—"Plumbing—Past and Present," J. Smith, Chief Plumbing Inspector.

Nov. 13—"The Value of the Grease Trap as a Sanitary Fitting," P. Pickering, San. Inspector.

Nov. 20—"Sanitation in the Royal Navy," H. B. Weston, late Sick Berth Steward R.N.

Nov. 27—"Comparisons in Scavenging," J. W. Stewart, Scavenging Superintendent.

Dec. 4—"Contagious Diseases in Animals—Their Clinical Symptoms," Dr. E. S. Bowman, Veterinary Inspector.

Dec. 11—"Comparative System of Dairy Inspection," E. C. Brown, Dairy Inspector.

Dec. 18—"Municipal Gas Inspection," A. J. Phillips, City Gas Inspector.

Christmas Day, New Year's Day, no Metings.

1916:—

Jan. 8—Opening Lecture, Dr. A. J. Douglas, M.D., Medical Health Officer.

Jan. 15—"Personal Hygienic Observations," H. Moore, Sanitary Inspector.

Jan. 22—"Food and Public Health," P. B. Tustin, Chief of Food and Dairy Division.

Jan. 29—"Destruction of Refuse," J. McHardy, Sanitary Inspector.

Feb. 5—"Reminiscences of Early Winnipeg," J. H. Pearson, Chief Health Inspector.

Feb. 12—"Economy of Smoke Prevention," W. F. Thornley, Deputy Asst. Chief San. Inspector.

Feb. 19—"Hospital Administration," G. Stoker, Sec. Hospital Board.

Feb. 26—"The Necessity for Food Inspection," G. R. Mines, Food Inspector.

March 5—"The Analysis of Some Disinfectants," A. Blackie, City Chemist.

March 12—"Should Typhoid be Isolated in Public Institutions," H. S. Sturgess, San. Inspector Infectious Diseases.

March 19—"Hygiene of Winnipeg in the Early Seventies," E. Marston, Secretary Health Dept.

March 26—Discussion, J. Foggie, San. Inspector.

April 2—"Industrial Hygiene," E. W. J. Hague, Asst. Chief San. Inspector.

April 9—"Location of Water Sources —Harvesting and Storing of Ice," A. W. Foote, Food Inspector.

April 16—"Facts and Fancies in Sanitation," A. Officer, Tenement Inspector.

April 23—"Sanitation of Lodging Houses," R. McQuillan, San. Inspector.

April 30—"Value of Gaseous Disinfectants in the Control of Communicable Diseases," W. J. T. Watt, Chief Inspector Communicable Diseases.

The Regina Branch is also very active. In addition to the meetings for members and associate members, a number of open meetings have been arranged and the general public invited to attend. The aim of these open meetings being educational, a wider selection of subjects has been included, such as: "My Own Life," "Manure and Measles," "What Does Regina Lack?," Extracts from Smiles', "Self-Help," and also Defoe's "Journal of the Plague Year," "What is Health?" "Homesteading," "Influences, Good and Evil," "Courtesy," "The Sanitary Inspector, from an Outsider's point of View," "Water," "The Three Primitive Appetites of Man," etc., etc.

These titles sound interesting and should result in well attended meetings.

The Executive Committe have sent copies of the syllabus of the Manitoba Branch and of our Constitution to the Chief Sanitary Inspectors of a number of the leading cities in Eastern Canada with the suggestion that the time is opportune for the formation of a Sanitary Inspectors' Association in Eastern Canada.

The Executive Committee take this opportunity of wishing the members the Compliments of the Season and a Happy and Prosperous New Year.